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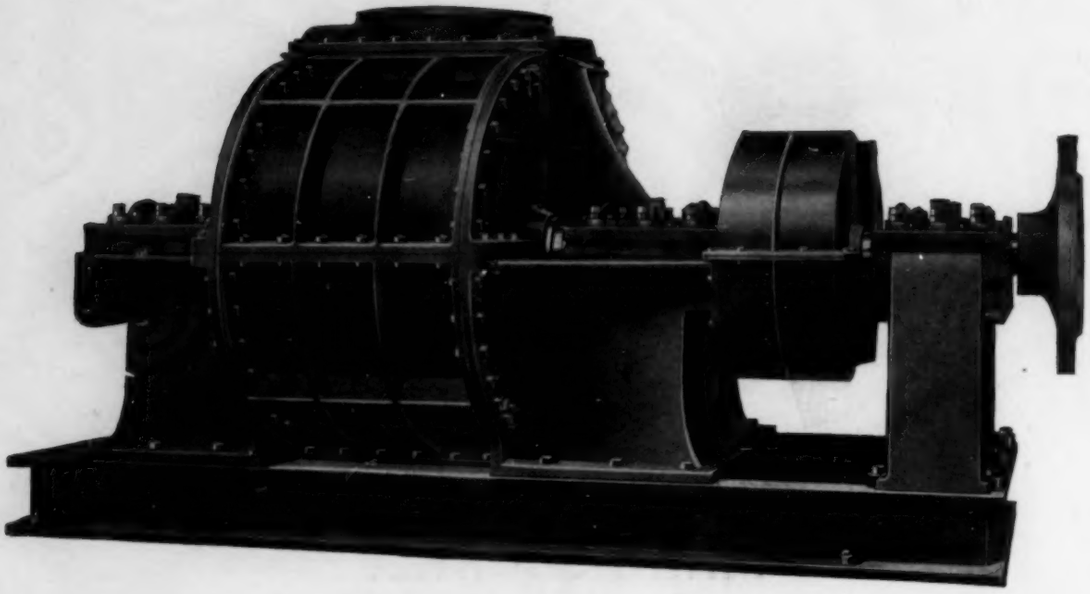

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NEW YORK
114 Liberty Street

THE IRON TRADE REVIEW

Vol. LXI Cleveland, July 26, 1917 *No. 4*

General Price Fixing Less Expected

Sentiment Generally Crystallizing into Belief Government Will Undertake No Widespread Control of Open Market—Makers Act to Keep Conditions in Check—Practical Stagnation of Buying—Specifications Lighter

A FINAL answer to the transcending trade question, how far government action in iron and steel prices will extend, still is to be given. Conflicting reports and opinions, however, are being converted into a growing belief that no sweeping federal policy is to be pursued. The defeat of a regulatory amendment, pertaining to iron and steel, in the food control bill in the senate has been an important factor in crystallizing sentiment along this line. Likewise it suggests that Washington is not so anxious to undertake the unending complications of complete price control. Concurrent with the more moderate view of possible federal interference with the general market, has appeared a more vigorous disposition among iron and steel producers to keep prices within bounds. This determination to hold the market in check along with the arresting effect on buying imparted by the unsettled government situation, points to more stable price conditions for the immediate future at least. Likewise it has not been without some added weight in causing buyers to hold back and an almost stagnant condition of new business has been displayed.

Specifications are Reduced

Government steel tonnage more noticeably is displacing that of the private trade in rolling schedules. At the same time, the private trade in finished steel apparently is not so insistent to specify against contracts while the present uncertainty obtains. Shipments for the first time in months have been less than specifications with some of the largest producers. Some plate mills, owing to the receipt of heavier allotments for war purposes, have notified their customers that deliveries arranged for August must be deferred one month. Plate deliveries for shipbuilding purposes are keeping to the recent heavy rate and it is indicated from the piling up of some tonnage in certain yards that shipments have been exceeding the rate at which material has been worked up. Makers continue freely to co-operate with the government in granting sharp concessions from established prices on war business. The situation is illustrated by sheets, where a large tonnage is being obtained at $45 to $60 a ton under the open market. In tin plate, the concession is $30 per ton under the minimum market quotation and over $100 under the maximum. Prices of wire products quoted by independent makers have not been affected to date by the recent announcement of a $3.20 maximum on nails by the American Steel & Wire Co. Further quotations of $4 per keg were put out by the independent producers during the week.

Pig Iron is Reacting

Reactionary price tendencies of moderate extent, most of which are related to resale metal, have spread out during the past week in pig iron. Where bessemer was principally involved in such irregularities a week ago, other grades now have been affected. Some of the furnaces also have taken voluntary action to draw a line against further advances and in so doing have fixed their maximum figure $2 or $3 under that at which they recently have made some sales. In different districts, $55, furnace, now is regarded as the top level on foundry, malleable and basic. A New York state furnace, about to begin operations, has accepted a considerable tonnage for New England and eastern delivery at $50, furnace. Certain brands of eastern Pennsylvania iron has been sold under the recent market in that territory. Lower quotations also have appeared in the south and it is reported some sellers are disposed to resell a portion of their low-priced iron. The market in no quarter shows weakness and the prevailing irregularity apparently is due to a process of readjustment following the effectual shutting off of new buying by the recent talk of government price-fixing. Further inquiries and sales are conspicuously few in all distributing centers. Positive information is lacking as to what the government has done on any of its direct or indirect requirements of pig iron for which it has been carrying on negotiations recently.

THE OPEN HEARTH

Price Fixing by Conciliation---The Right Method

A FEELING which in some quarters has become a conviction that the government is not likely to attempt to fix prices for the private consumer whose business is wholly unrelated to war necessities, has been gaining ground in the iron and steel industry. The action of the senate the past week in divesting the food control bill of any authority over iron and steel and metal prices has given something definite upon which to base such a belief. There are other indications to support the conclusion that the government is reluctant to undertake the intricate and complex problems surrounding an attempt at wholesale price-fixing, which disregards the dictates of supply and demand. It is possible that the federal authorities, after providing for the nation's war requirements in iron and steel and perhaps those of the allies also, would prefer to adopt a middle course and join hands with the producers to restrain the extravagant flight of prices and to keep market quotations within bounds where legitimate trade could be carried on without permanent injury.

Many leaders in the iron and steel industry long have felt that something should be done to keep prices within rational limits out of consideration for future good and the day of inevitable readjustment. Some policies have been framed along this line, but these have been practically barren of results. With a world-wide famine in steel brought about by war's insatiable demands and the regrouping of the sources of supply, the market repeatedly has demonstrated itself to be beyond the control of any one or several producers, no matter how powerful. Runaway conditions have prevailed and this was the situation when this country entered the war. With the government now immediately interested in the iron and steel market both as a buyer and from the standpoint of national welfare, a change has come over the situation. The mere suggestion of a possible arbitrary action regarding prices by federal authority has brought about an effectual checking of a continuous advance of many months duration which producers collectively under the law could not undertake. Feverish trading has been halted and both buyers and sellers have a much-needed opportunity to take stock of their position. Such a breathing spell is one of the most wholesome things that could have happened to the markets. It first has been necessary to bring the market under control before price regulation could proceed. A good start apparently has been made.

The occasion accordingly seems to be very propitious for a joint effort by the government and the producers toward again bringing the market under complete control, and to map out further action. To undertake such a plan seriously will require full understanding and co-operation between the government and the manufacturers and without doubt concerted action of the latter under federal supervision. It also necessitates a thorough appreciation of the conditions today surrounding consumption in those branches of business wherein iron and steel are a principal factor. Nothing less than complete teamplay between government, producers and consumers should be attempted if effective results are to be sought.

Fresh evidence of a willingness that long has existed to put a rein upon prices and generally to stabilize the market has been given by the recent acts of several iron and steel makers. The announcement of a week ago of the leading manufacturer of wire products virtually fixes a maximum price for itself for the period of the war. Various pig iron makers now have adopted maximum price schedules somewhat under the level at which they lately had been selling. This movement promises to extend in other directions.

These manifestations of a spirit of accommodation and adjustment to a national emergency open the way to a safe and sound handling of a vexatious problem. It would be gratifying if the government finally would grasp this fact. It is taken that the government in carrying out price regulation, wishes to accomplish its aims with a minimum of disturbance to established business. Such is sound economics and certainly so in time of war. By joining the complete authority to do whatever the occasion requires, represented by federal war power with the specialized business talent and experience represented by the producers and leaving the administration of the system to the latter, an effective working arrangement is possible. Then we shall have price-fixing by conciliation, not by compulsion. Through performing well their part in this program the iron and steel producers should profit richly in the closer and better relations between government and business after the war, which their attitude in this crisis greatly should promote.

Business Halts While Washington Delays

WELL-INFORMED Washington judgment is reaching the conclusion that the federal trade commission will not make its report on the investigation of present cost in the iron and steel industry, within the two to three weeks originally set. Three months may elapse before the steel industry learns what price

THE OPEN HEARTH

the government will pay. In the same way, predictions are common that congressional action on the war revenue bill may not be taken for two months. Either or both predictions may be disproved in the same way that the senate surprised everybody by its reasonably prompt acceptance of the aviation program. The steel industry would welcome a similar surprise on the war revenue bill, but the cost investigation can hardly be completed within two weeks and still be remarkable for its accuracy.

And in the meantime, the iron and steel industry is expected to run at top speed in order to give American participation in the war a definite meaning, although steelmakers do not know what prices their shipments will bring nor what provisions for excess taxes must be made. No one expects the government to be supernaturally endowed with the ability to decide every question promptly and wisely. Reasonable delays are better than injudicious action. But the repeated refusal of the legislative branches to react to war conditions is proving a serious barrier to business.

It was pointed out by THE IRON TRADE REVIEW last week that protests against the proposed taxes on excess profits and on undivided profits were reaching Washington. The past few days have witnessed a falling off in the number of these protests. Business men, apparently, cannot be aroused even over the prospects of being taxed excessively when the likelihood of reasonably speedy action by congress is so remote.

The war revenue bill is a hurriedly drawn measure that bears, in some of its stipulations, the marks of inadequate deliberation. Normal earnings are considered both for exemption and calculation purposes. The tax on undivided profits imposes a tax even on the money held to pay the tax itself. The tax bill would impose a greater burden upon a company just freed of financial distress than upon a concern which was prosperous in the *ante bellum* period. The inequalities and injustices are many; the prospects of wise judgment at the capitol are few.

Government officials who have been actually in contact with business men in negotiations on war questions have generally been frank in expressing their gratification at the co-operative spirit shown. The politicians who have not been in direct contact with business are equally frank in mulling over the disproved but formerly popular issues of the demagog.

War is the essence of co-operation. Co-operation connotes two sides to the question. If business is expected to co-operate, the other party must be as thoroughly efficient and as genuinely sincere. Business should not be halting now of all times. It would not, in fact could not, if it felt as certain of Washington as it feels of itself.

Need Cars to Keep Promise

PATRIOTIC leaders of the iron industry, the resources of which were mobilized immediately after the United States entered the war, have offered the entire output of their blast furnaces and steel works to the government, if it is needed. This service was offered voluntarily before the iron trade was called upon formally to support the nation. Ever since the United States entered the struggle to defeat Prussian autocracy, hundreds of its manufacturers have devoted the greater part of their time directly to the interests of the country.

It is to be regretted that the railroads apparently lack the facilities to co-operate to maximum efficiency with the shippers, most of whom have succeeded in minimizing the burdens of the carriers, by unloading and releasing cars quickly. This especially is true with reference to the unloading of Lake Superior iron ore by consumers along the lakes and at interior points. The Lake Superior Iron Ore Association some time ago asked blast furnace managers to release ore cars with the greatest possible dispatch. This suggestion has been carried out to the letter. At the present time, there is not more than a 24 or 36-hours' supply of iron ore standing on track or in transit. Moreover, the railroads have been able to divert a large number of cars previously used for the transportation of iron ore to the beehive coke fields, through the co-operation of pig iron producers.

The railroads, however, have not offered much relief to ore shippers. A few days ago, 30 vessels, carrying approximately 200,000 tons of iron ore, were awaiting the arrival of railroad cars at Ashtabula and Cleveland. Harbors along the Great Lakes must be kept clear, if the year's supply of iron ore and lake coal is to be moved. Railroad managers realize that shippers of iron ore and lake coal have a limited time in which to move these commodities. Unless more adequate railroad transportation service can be provided, producers of pig iron, so essential from the unusual imperative military standpoint, may not be able to satisfy demands of this country or its European allies.

The council of national defense directed the railroads to give preferential shipping service to the iron ore and lake coal trade. If the railroads now are meeting this request of the council to the best of their ability, immediate steps should be taken to increase the number of cars suitable for the transportation of iron ore and lake coal. Something must be done to obviate the possibility of a shortage of iron ore and lake coal, if the nation is to benefit fully from the offer of the iron trade to co-operate with the government.

Iron and Steel Prices

Corrected to Wednesday Noon

SCRAP, WAREHOUSE AND IRON ORE PRICES ON PAGE 212

PIG IRON

(Delivery this year.)

Bessemer valley	$57.00 to 58.00
Bessemer, Pittsburgh	57.95 to 58.95
Basic, Pittsburgh	53.95 to 55.95
Basic, eastern Pa.	52.00
Basic, Buffalo	53.00 to 55.00
Malleable, Pittsburgh	55.95
Malleable foundry, Chicago.	55.00
Malleable foundry, Phila.	55.00 to 55.75
Mallealble foundry, Buffalo.	53.00 to 55.00
No. 1X, Phila.	55.50 to 57.50
No. 2 foundry, Pittsburgh	55.95
No. 2 foundry, Cleveland	55.00
No. 2 foundry, Ironton	55.00
No. 1 foundry, Chicago	56.00
No. 2 foundry, Chicago	55.00
No. 2X foundry, Phila.	53.00 to 53.50
No. 2X foundry, N. J. tide.	53.25 to 53.75
No. 2X foundry, Buffalo	53.55
No. 2 plain, Philadelphia	52.50 to 53.00
No. 2 plain, N. J. tide	52.75 to 53.25
No. 2 plain, Buffalo	52.50
No. 2 southern, Birmingham.	45.00 to 46.00
No. 2 southern, Cincinnati	48.90 to 50.90
No. 2 southern, Chicago	50.00 to 54.00
No. 2 southern, Phila. del.	52.00 to 53.00
No. 2 southern, Cleveland	49.00 to 52.00
No. 2 southern, N. Y.	51.75 to 52.75
No. 2 southern, Boston	52.50 to 53.50
No. 2 south. interior, N. E.	53.00 to 54.00
No. 2 southern, St. Louis	48.40 to 53.40
Virginia, No. 2X, furnace	52.00
Virginia, No. 2X, Phila.	54.75
Virginia, No. 2X, Jersey City	55.00
Virginia, No. 2X, Boston	55.25
Gray forge, eastern Pa.	50.00
Gray forge, Pittsburgh	52.95 to 53.95
Gray forge, Birmingham	38.00
Silveries, 8 per cent, furnace	80.00 to 85.00
Silveries, 8 per cent, Chicago	85.00 to 92.50
Low phos. standard, Phila.	92.00 to 93.00
Low phos. Lebanon furnace.	83.00 to 85.00
Low phos., Pittsburgh	82.00 to 85.00
Charcoal, Superior, Chicago.	59.50 to 62.00
Charcoal, Superior, Buffalo.	55.00 to 60.00
Charcoal, Birmingham	45.00 to 50.00

COKE

(At the ovens.)

Connellsville furnace	$10.00 to 10.50
Connellsville furnace, contract	10.00
Connellsville foundry, contract	12.50
Connellsville foundry	12.00 to 12.50
Wise county furnace, contract	10.00 to 11.00
Wise county foundry, contract	11.50 to 12.00
Pocahontas furnace, contract.	10.50 to 11.00
New River foundry, contract.	10.50 to 11.00
New River furnace, contract.	7.50 to 10.00

FERRO ALLOYS

Ferromanganese, prompt	$415.00 to 430.00
Ferromanganese, last half.	375.00 to 400.00
Spiegeleisen, 20 per cent furnace remainder of year.	80.00
Ferrosilicon, 50 per cent, Pitts.	225.00
Ferrosilicon, 50 per cent, Pitts., 1st quarter	130.00 to 150.00
Bessemer ferrosilicon, 9 per cent.	$94.00
Bessemer ferrosilicon, 10 per cent.	95.00
Bessemer ferrosilicon, 11 per cent.	97.50
Bessemer ferrosilicon, 12 per cent.	100.00
Bessemer ferrosilicon, 13 per cent.	105.00

Ferrosilicon prices at Ashland, Ky., Jackson and New Straitsville, O., furnaces.

SEMI-FINISHED MATERIAL

BILLETS

Open hearth, Pittsburgh	$100.00 to 105.00
Open hearth, Philadelphia	100.00 to 110.00
Open hearth, Youngstown	100.00 to 105.00
Bessemer, Pittsburgh	100.00 to 105.00
Bessemer, Youngstown	100.00 to 105.00
Forging, Pittsburgh	125.00 to 135.00
Forging, Philadelphia	120.00 to 125.00
Forging, Chicago	100.00

SHEET BARS

Open hearth, Pittsburgh	$105.00 to 110.00
Open hearth, Youngstown	105.00 to 110.00
Open hearth, Cleveland	110.00
Bessemer, Pittsburgh	105.00 to 110.00
Bessemer, Youngstown	105.00 to 110.00

WIRE RODS, MUCK BAR, SKELP

Wire rods, Pittsburgh	$95.00 to 105.00
Muck bar, Pittsburgh	85.00 to 90.00
Grooved skelp, Pitts., nom.	4.00c to 4.50c
Sheared skelp, Pitts., nom.	4.50c to 5.00c

SHAPES, PLATES AND BARS

Structural shapes, Pitts.	4.50c to 6.00c
Structural shapes, Phila.	4.659c to 5.159c
Structural shapes, N. Y.	4.669c to 5.169c
Structural shapes, Chicago.	4.96c to 6.19c
Tank plates, Chicago	10.19c
Tank plates, Pittsburgh	9.00c to 10.00c
Bars, soft steel, Pittsburgh.	4.00c to 5.00c
Tank plates, Philadelphia.	9.159c to 10.159c
Tank plates, New York.	9.169c to 10.169c
Bars, soft steel, Chicago.	4.50c
Bars, soft steel, New York	4.669c to 4.919c
Bars, soft steel, Phila.	4.659c to 4.909c
Cotton ties, Pitts., June	$2.10
Bar iron, Chicago	4.50c to 5.00c
Bar iron, Philadelphia	4.659c to 4.909c
Bar Iron, Cleveland	4.50c to 5.00c
Bar iron, New York	4.669c to 4.919c
Bar iron, Pittsburgh	5.00c
Hard steel bars, Chicago.	4.25c to 4.50c

RAILS, TRACK MATERIAL

Angle bars, Pittsburgh, base	3.25c to 3.75c
Angle bars, Chicago, base.	4.00c
Standard bessemer rails, mill.	$38.00
Stand. open hearth rails, mill	40.00
Light rails, 25 to 45 lbs., Chic.	65.00 to 70.00
Light rails, 25 to 45 lbs., Pitts.	75.00 to 85.00
Relayers, standard, mill	38.00 to 40.00
Relayers, light, Chicago	60.00
Relaying rails, light, St. L.	58.00 to 62.00
Spikes, railroad, Pittsburgh.	4.75c to 5.00c
Spikes, railroad, Chicago	5.25c
Track bolts, Pittsburgh	5.50c to 8.00c
Track bolts, Chicago	6.50c
Tie plates, Chicago	$70.00 to 75.00

WIRE PRODUCTS

(To jobbers; retailers 5 cents more.)

Wire nails, Pittsburgh	$4.00
Coated nails, Pittsburgh	4.00
Plain wire, Pittsburgh	3.95
Galvanized wire, Pittsburgh	4.65
Polished staples, Pittsburgh	4.15
Galvanized staples, Pittsburgh.	4.85
Barb wire, painted, Pittsburgh.	4.15
Barb wire, galvanized, Pitts.	4.85
Cut nails, Pittsburgh	4.50

CHAIN, PILING, STRIP STEEL

Chain, ¾ in. proof coil, Pitts.	7.50c
Sheet piling, base, Pittsburgh	4.00c to 5.00c

Cold rolled strip steel, hard coils, 1½ inches and wider by 0.100 inch and heavier, base per 100 pounds, 9.00c to 9.50c.

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SHEETS

(In cents per pound.)

SHEET MILL BLACK.

No. 28, open hearth, Pitts.	9.00c to 9.50c
No. 28, bessemer, Pitts.	9.00c to 9.50c
No. 28, open hearth, Chic.	9.69c

TIN MILL, BLACK

No. 28, open hearth, Pitts.	9.00c to 9.50c
No. 28, bessemer, Pitts.	9.00c to 9.50c

GALVANIZED

No. 28, open hearth, Pitts.	10.25c to 11.50c
No. 28, bessemer, Pitts.	10.25c to 11.50c
No. 28, open hearth, Chic.	11.19c

BLUE ANNEALED

No. 10, open hearth, Pitts.	8.50c to 9.00c
No. 10, bessemer, Pitts.	8.50c to 9.00c
No. 10, open hearth, Chic.	9.69c
No. 10, open hearth, Phila.	8.659c to 8.909c

TIN PLATE

(Per 100 lb. box.)

Tin plate, coke base, nom. $10.00 to 15.00

IRON AND STEEL PIPE

(Prices adopted June 18, 1917.)

Steel

Diameter in inches.	Black. Per cent off.	Galv. Per cent off.
¼ to 3, butt	42	28½

Iron.

(Prices adopted June 30, 1917.)

Diameter in inches.	Black. Per cent off.	Galv. Per cent off.
⅛ to 1½, butt	33	17

BOILER TUBES

(Price adopted April 2, 1917.)

Steel, 3½ to 4½ inches, l. c. l.	34
Iron, 3½ to 4½ inches, l. c. l.	28

CAST IRON WATER PIPE

(Class B Pipe.)

Four-inch, Chicago	68.50
Six-inch and over, Chicago.	65.50
Four-inch, New York	68.50
Six-inch and over, New York	65.50
Four-inch, Birmingham	58.00
Six-in. and over, Birmingham	55.00

Class A pipe is $1 higher than Class B.

HOOPS, BANDS, SHAFTING

Hoops, Pittsburgh	6.00c to 6.50c
Bands, Pittsburgh	6.00c to 6.50c
Shafting, Pittsburgh, carloads	5 off to list

RIVETS

Structural rivets, Pittsburgh.	5.25c
Boiler rivets, Pittsburgh.	5.35c
Tinner's rivets, Pittsburgh.	30 off

NUTS AND BOLTS

(Delivered within 20-cent freight radius.)

CARRIAGE BOLTS

(⅜ x 6 inches, smaller and shorter.)

Rolled thread	30
Cut thread	25
Larger or longer	15

MACHINE BOLTS

(⅜ x 4 inches, hot pressed nuts.)

Rolled thread	35
Cut thread	30
Larger and longer	20
Cold pressed, semi-finished, hexagon nuts	50
Gimlet and cone point lag bolts.	40

NUTS

Hot pressed, square, blank	$1.80 off
Hot pressed, square, tapped	1.60 off
Cold pressed, square, blank	1.15 off
Cold pressed, square, tapped	.90 off
Hot pressed, hexagon, blank	1.60 off
Hot pressed, hexagon, tapped	1.40 off
Cold pressed, hexagon, blank	1.15 off
Cold pressed, hexagon, tapped	.90 off

Prices Present and Past

(Yesterday, a month ago, three months ago and a year ago.)

Quotations on leading products July 25, average for June, 1917, average for April, 1917, and average for July, 1916. Prices are those ruling in the largest percentage of sales at the dates named.

	Prices July 25, 1917.	Average prices June, 1917.	April, 1917.	July, 1916.
Bessemer pig iron, Pittsburgh..	$57.95	55.20	42.20	21.95
Basic pig iron, Pittsburgh.....	53.95	50.20	39.70	18.95
No. 2 Foundry pig iron, Pitts..	55.95	51.02	39.95	19.45
No. 2 Foundry pig iron, Chic...	55.00	51.00	39.25	19.00
Lake Superior Charcoal, Chicago	59.50	51.80	42.20	19.75
Malleable, Chicago	55.00	50.50	39.00	19.50
Southern No. 2, Birmingham...	46.00	35.75	24.50	15.00
Southern Ohio No. 2, Ironton..	55.00	38.60	33.00	18.50
Basic, eastern Pa.....	51.00	46.375	38.25	19.25
No. 2X Virginia, furnace.....	52.00	46.50	38.25	18.50
No. 2X foundry, Philadelphia..	54.00	47.50	41.50	20.00
Ferro mang., delivered.....	410.00	431.25	360.00	175.00*
Bessemer billets, Pittsburgh....	100.00	93.75	72.50	40.00
Bessemer sheet bars, Pittsburgh	100.00	101.25	72.50	40.00
Open hearth sheet bars, Pitts..	105.00	101.25	72.50	40.00
Open hearth billets, Pittsburgh.	105.00	93.75	72.50	40.00
Steel bars, Pittsburgh.....	4.00	3.62	3.38	2.50
Steel bars, Chicago.....	4.50	4.55	3.54	2.35
Iron bars, Philadelphia.....	4.909	4.259	3.659	2.559
Iron bars, Cleveland, delivery...	5.00	3.50	3.00	2.40

*Seaboard.

	Prices July 25, 1917.	Average prices June, 1917.	April, 1917.	July, 1916.
Iron bars, Chicago mill.....	4.50	4.00	3.19	2.35
Beams, Chicago	6.19	4.65	3.80	2.69
Beams, Pittsburgh contract.....	4.50	4.00	3.46	2.50
Beams, Philadelphia	4.909	4.659	4.659	2.659
Tank plates, Pittsburgh.....	9.00	4.50	4.50	2.86
Tank plates, Chicago.....	10.19	7.90	4.70	3.09
Tank plates, Philadelphia.....	10.159	9.659	7.159	3.909
Sheets, blk., No. 28, Pittsburgh	9.00	8.13	5.75	2.90
Sheets, blue anld., No. 10, Pitts.	8.50	5.57	5.37	3.00
Sheets, galv., No. 28, Pittsburgh	10.25	9.95	7.56	4.37
Wire nails, Pittsburgh.....	4.00	3.62	3.20	2.50
Connellsville fur. coke, contract.	10.00	8.50	7.25	2.42
Connellsville fdy. coke, contract.	12.50	10.10	7.90	3.15
Heavy melting steel, Pittsburgh	36.00	40.00	28.10	16.25
Heavy melting steel, eastern Pa.	35.00	36.625	26.00	15.00
Heavy melting steel, Chicago...	33.50	37.00	26.60	14.15
No. 1 wrought, eastern Pa.....	48.75	47.875	40.00	19.75
No. 1 wrought, Chicago.....	36.75	41.75	29.80	13.90
Rerolling rails, Chicago.....	43.75	46.00	31.90	15.70
Car wheels, Chicago.....	35.50	37.00	23.25	12.25

(For Additional Prices See Page 212.)

Price Concessions in Iron Spread

Resale Metal Generally Responsible for Reactionary Tendency But Some Furnaces Also Quote Lower—Some Producers Fix $55 as Maximum Figure—$50 Tonnage Sold by Eastern Maker—Market is Stagnant

Cleveland, July 24.—Some of the leading makers of pig iron in the lake and valley territory are exerting their efforts to stabilize the market, and they now are quoting $55 as their maximum figure on basic, foundry and malleable iron. All these producers have made sales of these grades above the $55 line in recent weeks. In certain cases little iron is left to be offered up to July 1, but in others, tonnage is obtainable at the $55 figure. This price now has become the representative market quotation. Early in the week a small lot of 3 to 3.50 per cent silicon iron was sold at $61, Cleveland furnace. The market is exceedingly quiet. Inquiries are for limited or small lots. Buyers have been held back by the prospect of government action, but the opinion has been growing that quotations for private consumption are not likely to be fixed by federal authority.

Lower Prices in East

Philadelphia, July 23.—A well-defined reaction in prices of pig iron has developed as a result of the dullness of the market during the past two or three weeks. A large eastern Pennsylvania consumer has placed an order for 500 to 1000 tons of No. 2X for last half with a nearby maker at $53, furnace, and at least one other eastern Pennsylvania maker offered foundry for this year at the same price. On the other hand, numerous resale tonnages for prompt or nearby shipment have been offered at $51 and $52, furnace. At the same time, most furnaces continue to adhere to the prices they recently were quoting and some business in No. 2X has been done during the week at around $56, Philadelphia, for last half, and $55 for next year. Market demand, if anything, has been less during the past week. Inquiries for first half now are exceptional and most of the comparatively small tonnage that now is wanted is for spot or nearby shipment. On the inquiry of the Lenoir Car Works for 6000 tons for first half, and on other lots recently put out, no action yet has been taken. Some Virginia No. 2X has been sold during the week at $52, furnace, for this year and the leading Virginia maker continues to ask $52.50, furnace, on No. 2X for first half. The only development in basic was an inquiry for several thousand tons for an eastern consumer but nothing came of this. Basic now may be quoted at $50 to $52, eastern Pennsylvania. Approximately 1000 tons of standard low phosphorus, both for this and next year, were sold during the week on the basis of $92 to $93, delivered Philadelphia. Some standard low phosphorus originally destined for export was offered at resale last week on this basis.

Prices Show Some Unsteadiness

New York, July 24.—The dullness which has featured the pig iron market in this district of late has led to some unsettlement in prices. An eastern Pennsylvania maker has offered No. 2X for nearby shipment at $53, furnace, and resale tonnages have been sold at $52 and offered as low as $51. A Buffalo furnace sold several hundred tons of No. 2X for prompt shipment at $53, Buffalo, and considerable foundry to be produced by an eastern New York furnace which is to be placed in blast shortly has been sold to New England consumers at $50, furnace. These prices are not characteristic of the situation generally, however, since most

makers continue to quote $55, furnace, for No. 2X for this year, and a number of sales of small tonnages, for nearby shipment mainly, have been made at around this level. Current inquiries involve a large tonnage of malleable for shipment this year to a Montreal consumer, 1500 tons of No. 2X for this year for a Philadelphia district consumer, 500 tons of high silicon foundry for a New Jersey melter for prompt shipment, and other lots. No business in basic, bessemer or low phosphorus iron is reported. Export inquiries from responsible buyers total about 30,000 tons; and involve foundry, basic and malleable for Japan, foundry, low phosphorus and bessemer for Italy, and foundry for South America.

Valley Market is Stagnant

Pittsburgh, July 24.—Scarcely any pig iron has been turned over this week by valley producers, and no inquiries of importance are pending. The market likely will border on stagnation until official Washington explains its proposed price-fixing program. The belief is entertained more generally that no attempt will be made to regulate prices paid by domestic consumers. Rather heavy tonnages of resale iron, offered a week or 10 days ago, apparently have been absorbed; at least, no reports of additional sales of metal affected by embargoes against exports have been heard. Bessemer is being held by valley producers at $57 and above. As previously stated, at least 6000 tons of resale bessemer were purchased last week at $53 and $55, valley, and at $53, southern Ohio furnace. The price of basic was marked up $1 a ton to $53, valley, by recent sales of 5000 to 10,000 tons at that figure. Foundry and malleable irons are being held at $55, valley.

Some Sales at $50

Buffalo, July 24.—Furnace interests of this district are inclined to sum up the pig iron situation this week as—inquiries light; orders nil. The refusal of furnaces to quote, even for 1918 delivery has led to a general falling-off of inquiries. Despite the talk about the government-made prices, one furnace which is sold up for seven or eight months is going on the assumption that there will be no price fixed. It is the opinion of representatives of this interest that the question is beyond the jurisdiction of the government. In this connection the coal situation is cited where this fuel is not to be had at the present time for the supposed fixed price. Makers say $55 still may be obtained readily provided definite delivery can be guaranteed the buyer. A Buffalo district furnace which has leased a blast furnace in eastern New York, announces that it will blow in about the latter part of August.

In order to obtain a backlog a considerable tonnage has been sold for New England delivery and export at $50. When negotiations have been concluded on a few inquiries, the price will be advanced to the regular market price of $55.

Resale Southern a Factor

Cincinnati, July 23.—The listless attitude assumed by pig iron buyers has been communicated to the sellers. Everyone is waiting on the government to take some definite stand in the regulation of prices, and in this period of uncertainty neither the large nor the small consumer of iron cares to take any risks. Small lots of foundry iron lately have been sold in this territory, but only for filling-in purposes. Reports that prices had weakened are without foundation, as far as this market is concerned. Southern iron for this year is quoted at $50 by the furnaces, but some resale iron can be had below this. For the first half of next year there is still a difference of opinion among producers in the south, and from $47 to $50 is quoted, with rumors that if any desirable contracts were brought forth they would be acceptable below the minimum figure. A few consumers of southern iron who contracted some time ago, when prices were much lower, have shown a desire to dispose of part of their iron at the present high prices, but these instances are few. A few small odd lots of Virginia foundry iron were sold in this territory for this year's shipment. Ironton prices remain at $55 to $56 for first half shipment, with practically no iron to offer for this year. The silvery irons have been dull lately, but no changes have been made in quotations. Ten per cent bessemer ferrosilicon has been sold in good quantity at $100, southern Ohio furnace.

Chicago Conditions Lifeless

Chicago, July 24.—Practically no activity is evident in the Chicago pig iron market. Prices on the northern grades remain firm and, as the furnaces are booked to capacity, little iron is available for this year or the first half of next. Iron is very scarce for delivery this year because of the sold-up conditions existing in this market. When carload lots are available for spot delivery the market price is paid without hesitancy. Some resale offerings for future delivery have been made at prices a shade under the market. Such sales do not necessarily indicate a weakening of the market, but are a psychological result of the inactivity and uncertainty which at present characterize the entire industry. Shippers of southern iron report transportation difficulties. Several southern stacks have been banked because of coke shortage. Quotations on southern grades have not been changed. One maker is offering iron for this year's delivery, provided the buyer orders twice the amount delivered this year for delivery next year. The use of scrap in furnaces has created a fair demand for silveries, and it is reported that the Jackson County furnaces are in a position to accept contracts for considerable tonnages for this year's delivery. Quotations on silveries remain at previous levels and no contracts have been placed recently.

Inquiries Fall Off

St. Louis, July 24.—Leading dealers report the pig iron market as being the dullest in many weeks. The demand from all quarters seems to have dried up suddenly, and a disposition to wait has supplanted the erstwhile eagerness to acquire tonnages regardless of cost. While specific quotations are irregular and display radical divergence of views, the trend is undoubtedly downward. An offering of quite a notable tonnage of No. 2 southern foundry was heard of this week at $48.40, St. Louis, for delivery over the first half of 1918. This is $3 to $5 under recent asking figures for this grade and delivery. Some small transactions, representing resale, were reported at from $2 to $4 below prices current earlier this month. Cousumers report it is easier to secure iron for spot delivery. One leading dealer said today that many of the inquiries received were evidently more for the purpose of feeling out the market than to actually get the iron. Consumers in this district are much less willing to contract for distant periods. Users are continuing the recent high record of consumption, and underlying conditions appear as sound as ever.

Southern Buying Very Light

Birmingham, Ala., July 24.—Lull in pig iron buying continues in the south, but there is no weakening of the general market and quotations are firm around the maximum prices. Some little buying, in car lots, are noted, premiums being paid by the consumers for immediate delivery. Quotations for No. 2 foundry for delivery next year are around $48 for local delivery, while what little iron can be gotten for this year is at $50. A little 3 per cent silicon iron for early delivery was sold during the past week in Birmingham at $51. Spe-

cial brand and analysis irons are held firmly at $50. The lull in the buying is the result of more or less anxiety as to what the government will do with regard to its needs and as to a regulation of the market. A number of consumers have urged shipment on old orders again and there is reiteration of the intent to charge losses occasioned by delay in delivery to the producers. There is steady delivery of iron, however, and accumulated stocks of iron are being reduced. The inventory of iron on hand, belonging to furnace companies, shows less tonnage on yards than for many months. An estimate is made that iron now being shipped will average $20 in price, while all the metal sold for future delivery by southern producers will average about $35. The aggregate business booked in this section will more than equal six to nine months' make.

Ferro Sales Not Pressed

Market Accordingly Shows Steadier Appearance—Lower Than $400 Reported on Early Metal—Ferrosilicon Easier

New York, July 24.—Pressure to sell ferromanganese has been lacking as compared with previous weeks, with the result that prices are unchanged from a week ago. While the market on the whole has been quiet, several 100 and 200-ton lots for next year, and several lots of 100 tons or less for this year, have changed hands. This business was done on the basis of approximately $400, delivered, for prompt and nearby shipment, $375 for last quarter and $350 for first half. Among inquiries which came into this district during the week was one for 500 tons for last quarter and first half for a consumer west of Pittsburgh. No further sales of English ferromanganese have been made. Latest advices indicate that sinkings of English ferromanganese en route to this country have aggregated about 2700 tons during the past five or six weeks.

Fair buying of 50 per cent ferrosilicon has been done during the week. This involved mainly shipment over the first half of next year, at a uniform price of $130, delivered. The tonnages placed were of moderate proportions. Several tonnages for shipment this year, including prompt delivery, were sold on the basis of $200, delivered.

In spiegeleisen the market is quiet. There have been a few sales but none of them involved important tonnage. On this business, however, the market has shown an easier tendency, prompt and this year's shipment both going at $80, furnace. On first half shipment the market continues to be quoted at $74 to $75.

Ferro Declines Further

Pittsburgh, July 24.—Quotations on 80 per cent ferromanganese have declined further. For shipment this quarter, most dealers are asking $400, delivered, but sales are reported at $375. Purchases of this alloy have been made for fourth quarter delivery at $375 and at $350 for shipment in the first quarter of next year. Lower prices appear to be the result of keen competition on the part of sellers. The market for other alloys is comparatively quiet. Fifty per cent ferrosilicon, as indicated a week ago, has declined slightly, but lower grades are steady. Twenty per cent spiegeleisen is being quoted at $80 and above.

Ferrosilicon is Sought

Chicago, July 24.—A moderate tonnage of ferromanganese was sold this week at $400, furnace. Inquiries for this alloy are practically nil, with quotations spreading from $400 to $425 for 1917. The level of $350 is being maintained for 1918 deliveries. The leading producer of ferromanganese in the Chicago district reports that its tonnages for this year's delivery are almost fully absorbed. Approximately 30 per cent has been sold for next year's delivery. A strong demand is reported for 10 per cent bessemer ferrosilicon, and although numerous inquiries have been received, no actual sales have been consummated.

Building New Shipyard

The new plant of the Beaumont Shipbuilding & Dry Dock Co., Beaumont, Tex., now is under construction. C. O. Yoakum, vice president and general manager of the new company, states that a number of contracts already have been executed including one for four standard wooden steamships for the United States Shipping Board Emergency Fleet Corp. It is expected that the first keel for the government vessels will be laid about Aug. 1. The new plant is located between the Neches river and Brakes bayou in the city of Beaumont. Eight building slips have been laid out.

Australia's available supplies of iron ore are estimated at 53,000,000 tons.

Pipe for Camps

Ordered in Considerable Quantity—Steel Pipe Prices Show Wide Spread

New York, July 24.—Among new inquiries for cast iron pipe is one for about 3000 tons for export to Holland. Eastern makers are submitting quotations on this tonnage but due to the difficulty in obtaining cargo space it is considered as unlikely that this business will be placed at this time. It also is considered as unlikely that early action will be taken on several thousand tons reported last week as involved in an inquiry from France. Approximately 3000 tons of cast iron pipe for army cantonments have been distributed during the week. This included some 1500 tons for a camp in Georgia, which went to the United States Cast Iron Pipe & Foundry Co.; 150 tons for the camp at Wrightstown, N. J., to United States, and 300 tons for Wrightstown to the Warren Foundry & Machine Co. It is expected that action will be taken shortly on the requirements for the camp at Yaphank, L. I. R. D. Wood & Co. are the low bidders on 740 tons of 6, 8 and 12-inch pipe for New York City. Private buying is not as active as a week or two ago. Prices are unchanged, at $65.50, New York, for 6-inch, class B, and $68.50 for 4-inch, class B.

Steel Pipe Prices Mixed

Pittsburgh, July 24.—Manufacturers of tubular products are co-operating effectively with the government, supplying materials for cantonments, steel beds and marine boilers. Despite the sold-up condition of the mills, government work is being rushed with the greatest possible dispatch. The domestic market is extremely quiet. Specifications against contracts are heavy, but no large contracts have been placed recently. Generally, mills cannot promise deliveries before the latter part of the year. The National Tube Co. and two other independent makers have made no changes in prices since April 2, last. Several independent mills, however, are quoting standard steel pipe at about $25 a ton above the prices of the leading interest.

Duluth Awards Contract

Chicago, July 23.—Pipemakers are transacting a fair volume of business in consideration of the time of the year which is their dull period. The government is still placing miscellaneous small tonnages. The United States Cast Iron Pipe & Foundry Co. was awarded a contract for 900 tons of 4 to 12-inch cast iron pipe for waterworks improvements for the city of Duluth.

Export Shapes in Demand

Japan Wants Tonnage and Other Countries Inquire—Government Orders Absorb Activity of Market

New York, July 24.—Export inquiries embody most of the current demand for plain structural shapes. Such inquiries during the past few days have involved several thousand tons, for shipment principally to Japan. One Japanese inquiry just out calls for about 1500 tons of standard sections to be used in shipbuilding. None of the makers are quoting on any of this foreign business. Domestic demand at present is of almost negligible proportions. About all that is wanted are small tonnages for preferred delivery, which are going at around 5c, Pittsburgh. On delivery at mill's convenience the minimum continues 4.50c, Pittsburgh. There is practically no demand for forward shipment. New structural tonnages placed in the east involve not much more than 2000 tons, of which practically all is for government buildings.

Market Remains Quiet

Pittsburgh, July 24.—Fabricators are making no announcements about contracts understood to have been placed recently by the government and by companies working on government contracts. Apparently, fabricating interests have been directed not to make public statements about their activities in connection with the war. No contracts have been placed for domestic purposes this week. Structural shapes are being held at as high as 6c in this district.

Truck Steel is Wanted

Cleveland, July 24.—Distribution of orders for army trucks with builders in this district is bringing out some inquiries for the necessary steel. A lot of 1400 tons for truck frames is about to be closed. Structural steel business except for war purposes remains exceedingly light. A 2000-ton power house, for which Bethlehem sections will be used, just placed by the Illuminating Co., is the largest commercial project to come up in this district for some weeks.

Open Sales Are Lacking

Chicago, July 23.—Fabricators of steel shapes report conditions paralleling the situation which has existed for some weeks. Propaganda to restrict the amount of commercial and industrial expansion has served further to curtail general building activities. The leading interest is rolling considerable tonnage for shipbuilding purposes. Its books have been closed on this product for some time. Lack of sales in the open market have precluded the possibility of any price alterations.

CONTRACTS AWARDED

Power house for the Illuminating Co., Cleveland, 2000 tons to T. H. Brooks & Co., Bethlehem sections to be used.

Public library, Philadelphia, 2500 tons, general contract awarded to John Gill & Son, Cleveland.

Bancroft and Isherwood Halls, Annapolis naval academy, 700 tons to American Bridge Co.

Bridges for Pennsylvania railroad, 300 tons, to American Bridge Co., approximately 200 tons to independent fabricators.

Buildings for government at Newport News, Va., about 400 tons to independent fabricators.

Buildings for government at Dover, N. J., 760 tons to McClintic-Marshall Co.

Buildings for Anaconda Copper Co., Butte, Mont., 200 tons to independent fabricators.

CONTRACTS PENDING

Stable, garage and repair shop at League Island navy yard, 170 tons, general contract to McCloskey & Bahls.

Isherwood Hall, Annapolis naval academy, 150 tons, general contract to J. Henry Miller.

Gets Big Cut in Sheets

Government Filling Needs Many Dollars Per Ton Under Open Market—1000 Tons Wanted for Cots

Pittsburgh, July 24.—The government is buying steel sheets on a constantly increasing scale, although little or nothing is being said about contracts placed for military purposes. An inquiry came out a few days ago for 1000 tons of bessemer black sheets, to be used in connection with the manufacture of hospital and camp cots. The government is obtaining steel sheets at many dollars a ton below prices being paid by domestic interests. Bessemer black sheets for military purposes are being offered at 6.50c to 6.75c; blue annealed, at about 6.50c, and galvanized, 8.50c to 9c, base. The subcommittee on sheets of the American Iron and Steel Institute met yesterday at Pittsburgh to consider ways and means of co-operating further with the government. The domestic market is exceedingly quiet. Scattering lots of all grades are being sold for shipment this summer at about published prices.

Government Places Sheet Tonnages

Chicago, July 23.—A leading independent has been asked to accept government contracts for sheet tonnages. Definite orders are expected to be placed shortly. These sheets will be in addition to those called for by recent contracts placed for cantonment stoves. Practically no sales of sheets have been made in the open market and the quotations remain unaltered.

Uncertainty Checks Inquiry

Youngstown, O., July 24.—Inquiries from the outside trade with manufacturers throughout the Mahoning valley district have been considerably reduced. Makers attribute this slackness to the delay of information from Washington relative to price fixing. Prices remain unaltered and bessemer black sheets No. 28 are quoted at 9c to 9.50c; galvanized No. 28, at 10.25c to 11.50c; blue annealed No. 10, at 8.50c to 9c. Much inconvenience in rolling schedules is being experienced in the district owing to the government's delay in granting permits for foreign shipments. There is no change in railroad conditions.

Independent Prices

On Wire Products Remain Unaffected by Action of Largest Maker

Pittsburgh, July 24.—Independent manufacturers of wire products continue to quote on the basis of $4 a keg for nails, $16 a ton above the price of the American Steel & Wire Co. The American company, as previously reported, has notified jobbers that its prices will not be changed during the war. It is apparent that jobbers supplied by the leading interest will find it extremely easy to compete against concerns depending upon independents for requirements, until prices are adjusted generally. No additional tonnages of nails have been purchased for cantonments, but it is believed that the government will be the most active factor in the market the remainder of the year.

Independent Prices Unchanged

Cleveland, July 24.—Recent action of the American Steel & Wire Co. in fixing upon a maximum price of $3.20 per keg for nails with a 50-cent resale profit to jobbers apparently has had no effect as yet upon the schedules of independent makers. Quotations $4 per keg on nails were made by the latter in this territory this week.

Less Plates For Market

Increasing War Allotments Cause Makers to Refuse Sales and to Defer Deliveries—Tonnage Piles Up in Shipyards

Philadelphia, July 23.—Orders for steel plates during the past week have been numerous and have involved a heavy tonnage. Most of this business came from the government, either directly or indirectly. In fact, the plate makers say that the government, through its various departments, is monopolizing their output. Numerous requisitions for domestic use have been presented but in most cases satisfactory delivery could not be obtained; 10 to 12 months is the best shipment the mills will promise, and even such delivery is named subject to the understanding that government orders are to have preference. An order for 1000 tons of tank steel was offered during the week at 11c, base, mill, for shipment over first quarter, but was turned down due principally to the fact that the prospective buyer was not a regular customer. Minimum on tank plates continues 10.159c, Philadelphia, while quotations on Lloyd's boat steel vary from 11c to 12.50c.

Shipments Exceed Specifications

Pittsburgh, July 24.—Dispatches announcing the resignation of Gen. Goethals as a member of the Emergency Fleet Corp., were read this afternoon by members of the iron trade with genuine regret. Ship platemakers literally were depending upon Gen. Goethals to bring the muddled affairs of the Fleet corporation out of chaos. For the first time in many months plate shipments are heavier than specifications and it is not believed that the market will reflect improvement until after it is known definitely what course the government plans to pursue. Car builders are not figuring in the market to any extent and other domestic consumers are specifying only for actual requirements. Rolling mills in this district now are furnishing about 75,000 tons of ship plates a month. It is reported that some tonnage is beginning to pile up at eastern shipyards. Ordinary tank plates continue to be listed at 9c to 10c for delivery at the convenience of the mill.

Private Buyers Set Back

Cleveland, July 24.—An eastern plate mill, which has been supplying considerabale tonnage to this territory, has announced that owing to the increased government orders, all private rolling schedules for August have been deferred one month. Local mills are receiving increased orders from manufacturers who are making government supplies. These makers are quoting from 9.50c to 10c, mill, on open business, the latter for first half delivery. A quotation of 11c, mill, was made this week on 500 tons of tank steel for export. A Canadian inquiry for 1200 each largely plates for two boats has been current.

Ship Plates are Placed

Chicago, July 23.—Plate tonnages continue to be distributed by the government. A considerable tonnage will be taken by the leading local interest and by a leading independent. These additional tonnages, it is understood, have been distributed to the mills on a pro rata basis of capacities. That the mills are reserving capacities for further government work is indicated by the fact that the leading independent in this district has been out of the market for some time and refuses all plate inquiries. Placing of such tonnages by the government indicates further progress in the shipbuilding program.

Tin Plate Wanted

In Large Lots by Allies—Government Pays $8.50 Per Box

Pittsburgh, July 24.—Since tin plate manufacturers virtually have rolled enough material to take care of the season's perishable food crops, mill managers now are offering their services to this country and its allies. Some material is being purchased direct by the government for the manufacture of cases for shell parts. This material is being sold at about $8.50, base. Rather heavy tonnages of terne plates also are being used for military purposes. The allies apparently are in urgent need of additional tonnages of tin plate. Early this month England inquired for 84,000 boxes and the Italian government sent out inquiries for 100,000 boxes a couple of months ago. It likely will be several months before manufacturers consider prices for shipment in the first half of next year. For delivery the first six months tin plate was obtained at $5.75 to $6 and at $7.50 to $8.25 for delivery the latter half of this year. It is believed that new contracts will be placed at several dollars a ton above the price at which books were opened for shipment the second half of 1917.

Quotes $15 on Prompt

Cleveland, July 24.—A local warehouse this week was quoted $15, mill, on a lot of tin plate for prompt delivery. The price asked by the mill was $3 above the figure asked by the warehouse for tin plate out of stock.

Steel For Shells

Continues to be Sought in Good Tonnage—$105 Sheet Bars

Pittsburgh, July 24.—Fairly heavy tonnages of billets and sheet bars, sold to anxious consumers some time ago, are being offered in the open market, as a result of the decrease in demand for finished materials. This is becoming more pronounced. So far as can be learned, no material has been sold, consumers refusing to manifest interest in the market, on account of disturbed conditions generally. Persons in close touch with the situation believe the market will adjust itself automatically as soon as business is able to pursue a more normal course. Forging billets, which had been nominally quoted at $115 as a minimum, have commanded $135, Pittsburgh. The market on wire rods is quiet.

Munition Steel Producing

Cleveland, July 24.—Several round tonnages of steel for gun forgings and munitions for which contracts have been taken or are under negotiation by manufacturers in this district, remain in the market. A recent sale of open-hearth sheet bars was closed at $105, northern Ohio mill. A small lot of forging steel was placed by a local buyer at $120, northern Ohio mill. The demand for electric and alloy steel continues to expand. Where leading producers only a short time ago were able to promise quick deliveries they now are quoting shipment in from six to eight months. This demand is coming from all directions and a considerable part of it is due to war requirements.

Strip Steel for Aeroplanes

Pittsburgh, July 24.—Manufacturers of strip steel products are being called upon for heavy tonnages of material for shipment to builders of aeroplanes in all sections of the country It is not known definitely how much strip steel will enter the construction of aircraft, but indications are that manufacturers shortly will be devoting fully 40 per cent of their capacity to the manufacture of military necessities. Material continues to be quoted at 9c to 9.50c, base.

Scrap Prices Slip Lower

Shrinking Sales as Buyers Hold Off Bring Further Reduction in Many Grades—Rerolling Rails an Exception

Chicago, July 23.—Declining prices of scrap iron and steel serve to emphasize the lull which pervades this market. Prices on steelmaking grades have been reduced from $1 to $4 and further reductions are expected to follow during the next few weeks. Consumers seem to be well stocked and it appears that they are keeping their inventories low until the prevailing uncertainty is dispelled. It is not generally believed that active buying will be resumed within six to eight weeks. Some inquiries have been received for low phosphorus grades for making munition steel and quotations on such material have not declined appreciably. A fair demand is also reported for malleable scrap. Offerings by railroads seem to be growing smaller from week to week. Some dealers believe that railroads are holding their old materials until the market strengthens. Approximately 4300 tons of miscellaneous iron and steel scrap are preferred by the railroads. The Chicago Rock Island & Pacific has available 3500 tons, including 1200 tons of No. 1 steel rails and 500 tons of No. 3 steel rails.

Trading Volume Shrinks

New York, July 24.—Dullness continues accentuated in the iron and steel scrap market in this district. Current transactions involve only 10 to 20 per cent of the tonnage that was changing hands up to two weeks ago. Uncertainty as to whether and how the government will regulate prices in the iron and steel markets generally is the principal cause for this condition. It now is easy to buy any grade of scrap, and most holders are willing to accept almost any reasonable figure that is offered. As a result, prices have sagged off materially. Dealers' prices have declined as follows: Axles $4, shafting $5, heavy melting steel $3.50, wrought pipe $4.50, cast borings $1.50, machinery cast $2 and stove plate and grate bars 75c.

Buyers Dominate Market

Philadelphia, July 23.—Activity in the scrap market in this district during the past week has been confined to sales of occasional carload lots which involve a comparatively negligible tonnage in the aggregate. The only inquiry of any importance was one from an eastern Pennsylvania steelmaker for 1000 tons of heavy melting steel. This has not yet been acted on, as the price mentioned, $34, delivered, did not prove attractive. New inquiry is light and where a consumer does ask for material he is unwilling to pay anything like the prices recently prevailing. For instance, $47.50, delivered, is the highest offer for No. 1 railroad wrought. All grades are easy to buy and dealers make offers very cautiously. Prices during the week declined as follows: Heavy melting steel, $1; No. 1 railroad wrought, $3.75; wrought pipe, $1.50; No. 1 heavy cast, $3.50; No. 1 forge and bundled sheets, $0.75, and frog, switch and guard rail scrap, $1.

Scrap Stagnant at Pittsburgh

Pittsburgh, July 24.—The market for old iron and steel scrap in western Pennsylvania borders on stagnation. Consumers are not attempting to buy material and dealers do not appear anxious to sell at prevailing prices. Quotations on most grades continue to decline. Heavy melting steel is being offered at $36, or $11 a ton below the high point of the market touched several weeks ago. Prices on other grades are correspondingly lower. The bottom of the market is not yet in sight. Dealers seem to have lost their nerve when talk of price regulation first was heard. It is not likely any activity will be noted until the general market pursues a more nearly normal course.

Dull Period at Buffalo

Buffalo, July 24.—A dull period has appeared in scrap and is evidenced by a general shrinkage in prices on almost all grades. These prices largely are nominal, due to the fact that there is very little trading going on and that is between brokers. Practically every dealer has orders booked at prices prevailing during the past two or three months, of sufficient volume to carry them through the quiet period which is now expected to prevail the remainder of July and possibly in August. There is little disposition on the part of dealers to seek new business. They are bending every effort to getting out present orders. Consumers also are showing little interest. No sizable sales were made during the week, with the exception of some material on track, which dealers found preferable to sell rather than to unload. Some sales were made to balance out shipments.

Hold On Too Long

Cleveland, July 23.—Some scrap producers, while anxious to sell some of their accumulations, hesitate to do so at the present greatly reduced prices. Dealers say that consumers are beginning to run short and will soon have to get into the market, but there are no signs as yet of any buying movement. More than one producer was caught by the sharp decline of prices. They held onto their old iron and steel while the market was rising, figuring to get the highest possible price, but were caught by the sudden drop. Some of them look for another rising market and are holding on; but most of them would be glad to let go at what they consider a reasonable price, which happens at present not to coincide with the dealers' view. Prices continue to fall. Heavy melting steel just now is quoted at $32 to $33; cast borings at $18 to $18.50; machine shop turnings at $16.50 to $17. Persistent demand for rerolling rails, over 6 feet, the only really active item in the list, keeps the price in this grade up to $45 to $46. Transportation is improved generally.

Reductions Less Marked

Cincinnati, July 23.—The reduction in scrap prices has not been so marked in the past few days. This does not mean there has been any recovery of lost ground, but the reductions are smaller and the general sentiment is more hopeful. An unwillingness on the part of consumers to contract ahead due to the talked-of government regulation of prices generally is accepted as a large factor in the present unsettled market. Cast borings and steel turnings are two grades which have held their own. This is due to an increased use of this class of scrap. The supply from machine shops was never so heavy. A peculiar feature of the present market is the slack demand for old iron rails and for rerolling steel rails. Both have been in excellent demand and have been commanding top notch prices, but lately have shown a weakness not satisfactorily explained.

Relaying Rails Are Firm

St. Louis, July 21.—The market for old iron and steel has ruled very dull and listless throughout the past week. The trend of prices generally continues downward, with some radical declines in certain grades. Consumers are out of the market for the moment, claiming to be well supplied.

Uncertainty relative to the government program is holding down purchasing, and the easier tone in the pig iron market also is a factor. Labor troubles in all directions constitute another consideration. Then there is the usual July lull. The rate of consumption, however, has been reduced very little. Railroad offerings are still unusually light. Carriers are either short of cars and lack labor to gather and load their scrap or they are holding off awaiting more auspicious market conditions. Relaying rails continue very strong. Available supplies are limited and dealers could dispose of tonnages vastly in excess of what they can obtain. Railroad offerings before this market during the week included Louisville & Nashville, 2100 tons; Toledo, St. Louis & Western 1050 tons; Kansas City and Southern, 200 tons, and a small open list from the Terminal Railroad association of St. Louis.

Weak Market in South

Birmingham, Ala., July 24.—Old material prices continue to drop in the south and the market is weak. Consumers are demanding repeated concessions. Practically all grades showed further weakness this week. There are some heavy contracts for scrap at high prices on the books with dealers in this section. Stocks of scrap in this territory are moderate. Consumers assert that the scrap prices have been beyond reason. The dealers reiterate the statement that with pig iron and steel commanding the highest prices ever known, the high figures for scrap are justified. Stove plate has declined more than $1, while No. 1 machinery went off more than $3 last week.

War Needs in Bars Expand

2500 Tons Wanted for Large Shells, and 2600 Tons for Arsenal —Tire Steel Closed—Big Shafting Orders

Youngstown, O., July 24.—The government has made inquiry for 2500 tons of shell bars ranging from 7 to 11 inches in diameter, to be used for the making of munitions for the navy.

Place Bars for Shells

Pittsburgh, July 24.—Additional contracts for bars have been placed by shellmakers, but details of these transactions have not been announced. The government has been an active factor in the market for reinforcing material, buying heavy tonnages of virtually all sizes. This material is entering the construction of buildings and other reinforcing work in various sections of the country. The domestic market is extremely quiet. Agricultural implement makers are specifying briskly, but the automobile trade is decidedly inactive. Tonnages previously taken by automobile manufacturers are now being absorbed by shellmakers. Steel bars are quoted at about 4c to 4.50c.

Want Bars for Arsenal

Chicago, July 23.—An inquiry for 2800 tons of concrete bars has been issued by the Stone & Webster Corp., for use in one of the new buildings for the Rock Island arsenal. One of the leading independents is accepting a restricted number of orders for soft steel bars and reports sales at 5c. This interest has also made a number of sales of soft steel bars at higher figures. Export demand is strong, numerous inquiries coming from Japan. The bulk of the business, which is reported large, is composed generally of small tonnages. A valley and an eastern interest have withdrawn from the market and report little activity. This condition is welcomed by these mills, as it gives them an opportunity to reduce their unfilled tonnages.

Small Tonnages of Hard Bars Available

Chicago, July 23.—A leading independent reports numerous inquiries for hard steel bars which are quoted at 4.50c, Chicago. Efforts are being made to cover the requirements of its regular customers and although no large tonnages have been accepted, the volume of business reaches a fair total.

Tire Steel is Placed

Cleveland, July 24.—An order for 1000 tons of tire steel for convoy wagons recently awarded by the army has been placed with a Pittsburgh mill by a northern Ohio manufacturer. The inquiry for 1200 tons for 30,000 tires for similar use which was put out a week ago by Cleveland manufacturers remains unplaced. Miscellaneous lots of steel for aeroplane construction continues to be ordered and the indications are a large tonnage may be called from this territory when the government distributes contracts for its great program of aeronautical construction. Concrete bars are quoted 4.25c, mill, and bar iron at 5c, Cleveland. Some makers of hard steel producers are willing to accept orders for future delivery only on condition that the price be left open until shipment is made and that the latter be governed by the latters' convenience.

Shaftingmakers Help Nation

Pittsburgh, July 24.—Fully 40 per cent of the capacity of companies manufacturing shafting is being used directly or indirectly by the government. The larger portion of this is going into the manufacture of fuses and small shells. In addition, rather heavy tonnages are being used by aeroplane builders and for the manufacture of motors of various types. According to some people, the government will take fully 75 per cent of the output of shafting before the end of the year. Patriotic shaftingmakers welcome the withdrawal of automobile makers from the market. Specifications from the automobile trade are much below what they were a few months ago, and indications are that the situation will become even quieter toward the end of the year. Shafting continues to sell at 5 per cent off the list to the list for carload lots.

Hoops and Bands Steady

Pittsburgh, July 24.—Manufacturers are experiencing no difficulty disposing of hoops purchased by the distilling interests, most of which withdrew from the market when it first was proposed by the government to prohibit the manufacture of distilled spirits. Hoops and bands are being sold freely at 6.50c and above. Little material is being offered for nearby shipment.

Nuts and Bolts Higher

Pittsburgh, July 24.—On account of a revised plan adopted by the government with reference to the distribution of orders for 35,000 tons of rivets, manufacturers will not receive specifications for this material until they are placed directly by shipbuilders. The government is calling upon nut, bolt and rivet concerns for material on a constantly increasing scale. Domestic consumers are finding it increasingly difficult to obtain their requirements. Although no formal advances have been made, previously prevailing prices no longer represent the market. Generally, nuts have been advanced 5 per cent and bolts 5 to 10 per cent. The price on rivets is unchanged, structural being quoted at 5.25c and boiler at 5.35c.

Navy Buying Chain

Philadelphia, July 24.—The bureau of supplies and accounts of the navy department has received bids on 220 tons of close link chain for 50 tons of stud link chain.

Great Shipyard is Planned

Steel Corporation Forms Federal Shipbuilding Company to Build Big Plant on Newark Bay—Will Aid Government

New York, July 24.—The Federal Shipbuilding Co. has been chartered in Trenton, N. J., by interests identified with the United States Steel Corp., to develop and operate the shipyard recently put under construction at Newark bay between the Hackensack and Passaic rivers, in New Jersey. The Federal company is capitalized at $3,000,000, but plans for the shipyard call for an initial outlay of about $6,000,000. The new yard will have ways for the building of 10 large ocean freighters simultaneously, and is expected to be in operation in about six months. The papers of incorporation set forth that the Federal Shipbuilding Co. proposes to build vessels, air craft, submarines, plants, bridges, etc., and the incorporators are: William W. Corlett of New York, and Kenneth B. Halstead and Edward F. Briggs of Hoboken, N. J., who are connected with the legal department of the United States Steel Corp. The new shipyard is to cover 150 acres and its construction and operation will be in charge of Robert MacGregor, a marine engineer, who for some time has been connected with the Steel Corporation in an advisory capacity on shipbuilding. The steel plates and shapes to go into the ships will be fabricated by the American Bridge Co., which has had much experience in the last two years preparing material for standardized vessels turned out by the Chester Shipbuilding Co.

The new company contemplates the building of steel bottoms for cargo boats to be used on the New York States barge canal. In fact, the Federal Shipbuilding Co. was evolved originally to construct canal barges from standard designs and the plans were extended when the need for additional ocean tonnage to combat the German submarine campaign became recognized. While the new yard will be subject to orders from the government first of all, it is known that private contracts also will be accepted. The ships to be built will range from 6000 to 8000 tons deadweight and will conform to standard designs.

The Kirk Supply Co., Pittsburgh, recently has taken a number of interesting contracts, including the following: Twenty-five charging box cars, built by the Easton Car & Construction Co., Easton, Pa., for delivery to the Canton Sheet Steel Co., Canton O.; six cars of similar type for the Edgewater Steel Co., Pittsburgh, with works at Oakmont, Pa.; complete foundry flask requirements, to be furnished by the Sterling Wheelbarrow Co., Milwaukee, for the Producers Supply Co., Franklin, Pa.; ¾-yard concrete mixers of the Marsh-Capron type and 1000 Sterling column clamps for the Union Switch & Signal Co., which is building a new plant at Swissvale, Pa. Orders for the Union equipment were placed by the Stone & Webster Corp., Boston.

Export Ban

Is Affecting Many Shipments—License Problem Creates Friction

Washington, July 24.—The problems faced by the government in taking over control of the exportation of the principal commodities, including the major iron and steel products, are being solved as expeditiously as possible. The actual supervision is in the hands of the exports council, department of commerce. The licensing board received 5210 applications in the short period between the issuance of the President's proclamation and the date when it became effective. These were all handled before July 15, the date the export ban took effect.

While the main purpose of the control of exports—the shutting off from the enemy of any serviceable supplies—is always given first consideration, every effort is being made to lighten the burden upon exporters and ocean carriers. An indications of this is seen in the announcement a few days ago that J. A. Parker, export manager of the United States Steel Products Co., New York, has been placed on the council to advise the division of export licenses, bureau of foreign and domestic commerce, as to the demand and supply of iron and steel in this country and the relation of both to their export.

Secretary Redfield, when asked by the correspondent of THE IRON TRADE REVIEW concerning the possibility of other experts in other lines being given similar appointments, stated that this question had not been considered. Mr. Redfield indicated that the department intended to secure expert advice whenever necessary, and that as the need arose other appointments would be considered. The export license problem has not been handled, however, without some friction, as is indicated by the resignation last week of Dr. Edward E. Pratt, secretary of the advisory council, and chief of the bureau of foreign and of domestic commerce. Two days after the export proclamation took effect Dr. Pratt sent his resignation to President Wilson, following a request by Secretary Redfield that he take such action. Both men refused to discuss the causes for this sudden action.

B. S. Cutler, former president of the Cutler Desk Co. and one of the business men who have recently placed their services at the disposal of the government, has been made acting chief of the bureau. He has been assistant chief. C. A. Richards, chief of the division of export licenses, will act as secretary of the exports council.

Navy Plans Big Outlay for Ordnance Supplies

Washington, July 24.—Estimates aggregating $137,366,177 were submitted to the house last week by Secretary Daniels to cover emergency war requirements of the navy. The estimates include expenditures for ammunition and ordnance supplies, as well as improvements to various yards and docks, and the enlargement of the Washington navy yard and gun factory. The estimate for ordnance and ordnance stores totals $12,446,000; for ammunition, $25,000,000; for batteries and outfits for vessels, $22,000,000; for reserve and miscellaneous ordnance supplies, $30,000,000; for yards and docks, $23,400,000.

The extent of the yard and dock improvements is not indicated except by the size of the appropriation asked for, while no hint is given of the enlargements contemplated at the navy yard and gun factory here. Secretary Daniels had announced a few days earlier that work on the proposed armor plate factory would not be undertaken for some time. Secretary Baker announced last week that the construction of a government nitrate factory to cost $4,000,000 would be started at once.

Plants Are Combined

Barrett & Haentjens and the Benjamin Steel & Iron Co., Hazelton, Pa., have combined in the manufacture of a number of specialties. The Benjamin company, which is a subsidiary of the Pennsylvania Stripping, Quarrying & Contracting Co., is erecting large new shops at which mining and steam shovel machinery is to be turned out. Thomas Henderson has retired from the Coxe Traveling Grate Co., Hazelton, to become chief engineer of the Benjamin company.

Market Stagnant

In Iron and Steel at Pittsburgh—More $55 Bessemer

Pittsburgh, July 25. (By wire.)—The market for finished steel products and pig iron are at a complete standstill and prices are regarded as somewhat nominal. It is reported that additional tonnages of bessemer are available on the basis of $55, valley.

An inquiry is out for 10 miles of 12-inch steel line pipe involving 800 tons for shipment to Louisiana.

Many Ovens Planned

Contracts have been let in recent months for a total of 326 additional by-product coke ovens in the United States and for 120 by-product coke ovens in Canada. These include 60 Semet-Solvay ovens for the Ironton-Solvay Co., Ironton, O.; 24 Semet-Solvay ovens for the Chattanooga Gas & Coal Products Co., Chattanooga; two additional batteries, comprising 102 Koppers ovens for the Youngstown Sheet & Tube Co., and 140 Koppers ovens, representing two additional batteries, for the Indiana Steel Co., Gary, Ind., and 120 Koppers ovens for the Dominion Steel Corp., Sydney, N. S. These ovens will have a total annual production of coke of over 1,800,000 tons. They will increase the number of ovens built and building in the United States as shown in the table published on page 128 of the July 19 issue of THE IRON TRADE REVIEW, to 9477, with a total coke production of approximately 32,176,000 tons.

Place Contracts and Take Bids on Steel Items

Washington, July 24.—The bureau of awards of the navy department has received bids on 15,000 six-inch common projectiles.

The commanding officer of the Frankford arsenal, Philadelphia, has received bids for the finished machining of 25,000 three-inch shrapnel head bars to be furnished by the arsenal. The Worcester Mfg. Co., New York, bid 28 cents each for an 8-hour day and 24 cents each if the hours of employment were not limited and the Modern Machine Works, Inc., Philadelphia, 70 cents each if the hours of employment were not limited.

The bid of Ferdinant-Metzgar, Philadelphia, of $23.30 each has been accepted for furnishing 75 subcaliber cartridges for 3-inch field guns by the commanding officer of the Frankford arsenal. The Bethlehem Steel Co. bid to the commanding officer of the Frankford arsenal was 8.10c per pound for 4268 feet of 2¼-inch diameter and for 1328 feet of 0.812-inch heat-treated alloy steel; 8.25c per pound for 1097 feet of 7.18-inch and for 438 feet of 1¼-inch diameter and 8.45c per pound on 226 feet of 1-inch diameter. The Carpenter Steel Co. bid 15 cents per pound for all items.

Bids will be taken by the supply officer of the Norfolk navy yard on July 29 for 700 tons of scrap iron and steel; 100 tons of iron and steel borings, and 30 tons of boiler tubes; on Aug. 17 by the supply officer of the Puget sound navy yard on 300 tons of scrap steel and other discarded supplies; on Aug. 9 by the supply officer of the Philadelphia navy yard on 500 tons of scrap steel and various other old material; and on July 25 by the supply officer of the Washington navy yard for 3,000,000 pounds of brass foundry ashes.

Acquires Machine Plant

The Falls Rivet Co., Kent, O., has taken title to the plant and business of the Kent Machine Co. of the same city, and will continue to operate the business separately under the name of the latter company. The line of concrete mixers and other products manufactured by the Kent Machine Co. for the past 10 years will be marketed as heretofore. Additional manufacturing facilities, to enable the company to greatly increase its production, now are being made. The personnel of the Falls Rivet Co. includes: President, M. G. Garrison; vice president, W. S. Kent; secretary, Myles E. Ewing, and treasurer, Roy H. Smith.

Large Refrigerator Car Plant is Planned

A tract of 25 acres on the east side of the Rock river, Beloit, Wis., has been purchased by the Lipman Refrigerator Sar & Mfg. Co., capital stock, $500,000, organized by Carl Lipman, Beloit, to install automatic brine circulation systems of refrigeration in freight cars and to manufacture complete refrigerator cars employing this system. The company will spend between $75,000 and $100,000 in the construction and equipment of the first unit of the new plant, and now is ready to award contracts. The buildings will include a machine shop, foundry, sheet metal and woodworking shops, blacksmithing plant, electric welding shop and car storage shed, 200 feet long, with double tracks. The Lipman company has the exclusive manufacturing and installation rights of the brine circulation system in the United States and Canada. Carl Lipman, president and general manager, is a designer and manufacturer of pumps and compressors, with a large plant in Beloit.

Will Erect Coal Bridge

The Great Lakes Coal & Dock Co., Duluth and Superior, will erect a new electrically operated coal-handling bridge at its dock on St. Louis bay, at the head of the lakes. The work is in charge of the Mead-Morrison Co. Much of the material will come from Milwaukee, where the company purchased a dismantled railroad bridge recently replaced with a new drawspan.

To Extend Coke Capacity

Arrangements have been made by the Cambria Steel Co., Johnstown, Pa., to open a new coal mine along Hinckston Run, adjacent to its plant preliminary to the eventual installation of a new coke plant according to a statement made by E. E. Slick, vice president and general manager of the Midvale Steel & Ordnance Co. The size of the coke plant has not been determined, but it will be adequate for the company's needs for several years to come. The Hinckston Run site comprises about 600 acres.

Warehouses Busy

Chicago, July 24. — Manufacturers, failing to receive encouragement from mills, have turned to warehouses and are buying briskly. Plates are especially heavy in demand. Steel and iron bars from stores are still quoted at 4.50c, shapes at 5c and plates, nominally, at 8c. Quotations on plates cover a wide spread, as few are available and the prices are determined largely by deliveries. No. 10 gage blue annealed and No. 28 gage black sheets are still quoted at 9.50c; No. 28 gage galvanized remain at 11c. Dealers report an advance in spikes from stores to 5.25c. Three-eighths-inch chain has been advanced to 9c, base.

Government Buys Pipe

Youngstown, O., July 24.—The pipe market is more active with Mahoning valley mills. One producer within the past week has completed an order from the government for 80,000 feet of 4 and 6-inch wrought iron pipe. Another maker is fulfilling an inquiry of a fairly large size for smaller diameters, ranging from 1 to 4 inches. This pipe, it is understood, will be used for heating purposes at the various cantonments.

Spot Coke Still Slumping

Furnace Fuel Sells at $9.75—Car Supply Maintained at 100 Per Cent—Settling Contract Prices Daily

Pittsburgh, July 24.—Quotations on spot furnace coke continue to decline. Late last week $9.75, ovens, was done and sales have been made this week at $10 to $10.50. For the first time in many months, the car supply in the Connellsville regions has been 100 per cent of normal for more than a week. The supply last week was 100 per cent, compared with 95 per cent the preceding week, and a 100 per cent supply has been maintained this week. The improved traffic situation largely is responsible for the sharp decline in the price of fuel. Foundry coke is being sold at $12.50, ovens. Prices on contract furnace and foundry coke are unchanged. Many furnaces protected as to tonnage but not as to price are making day to day settlements with the producers. These are being based upon the price at which the bulk of the tonnage is being sold each day. Some cokemakers for several months have refused to enter into contracts calling for extended shipments. Some complaint is heard about the labor situation in the Connellsville fields. Coke oven employes are refusing to work full time, making it impossible for many plant managers to take advantage of the improved traffic situation. Production of coke the week ending July 14 was 349,519 tons, compared with 349,218 tons the week before, according to *The Connellsville Courier.*

Government Wants Coke

Philadelphia, July 23.—Coke prices continue to recede in this district. One fair-sized tonnage of spot furnace coke has been sold at $11, Connellsville, and offers of $10.50 have been made since by sellers. Spot foundry coke has been sold here both at $14.50 and $15, Connellsville. The Washington navy yard has put out an inquiry for 150 tons of foundry coke for quick shipment. In May, as usual each year, bids were taken for the yearly requirements of the various navy yard foundries, but, due to the high prices quoted, no action was taken. It now is believed that the various yards instead of closing for a year's supply will come into the market for requirements at intervals.

Shortage Forces Furnace Banking

Chicago, July 24.—No by-product coke is available in the Chicago district. Demand continues strong for Connellsville furnace coke. The shortage is indicated by the fact that stacks both in the south and the north have been forced to bank because of fuel scarcity. Quotations on foundry grades have declined during the past week, and a few small tonnages of this grade have been sold at from $13 to $14, ovens.

Market Grows Easier

Cincinnati, July 23.—Spot coke is somewhat easier, but high prices on foundry fuel especially are still obtained where rush shipments can be obtained. Connellsville foundry last week brought as high as $14.50, ovens, which is about $2.50 below its highest level the last week in June. Contract prices are slightly lower. Leading interests state that from $11.50 to $13 is quoted on foundry for future shipment and from $9 to $10 on furnace coke. No spot furnace coke has been sold lately but nominal quotations would be around $10.50 to $11.50. The shortage of labor is the chief source of worry for producers. The car situation also continues to give trouble, but not as much as at this time last month. No Wise county furnace coke is to be had, and little in either the Pocahontas or New River districts. Foundry prices in those districts are around $12.50 to $14 for spot and from $11 to $12.50 for contract. New River foundry coke is firmer than either Wise County or Pocahontas.

Inquiries Pick Up

St. Louis, July 24.—The coke situation is a shade stronger. Quite a marked revival in inquiries has been noted. Orders are coming in from western and northern territory, and one inquiry was received from Virginia. So far as can be learned, this is the first time that state has figured in the St. Louis market as a purchaser of coke. The inquiry, which was for several thousand tons, specified a certain grade manufactured by the by-product plant of the Laclede Gas Light Co. That plant, however, and virtually all other producers in this district are well sold up. General consumption continues on a tremendous scale The car situation is much better. The labor situation in the lead belt continues unfavorable. The falling off in mine production is being reflected in smelter operations, and the demand for coke from that source has been seriously affected. The state military authorities now have the situation well in hand, however. Prices were somewhat irregular. Connellsville and Virginia 72-hour foundry coke was quoted from $15.85 to $16.95, St. Louis, for nearby. A nominal quotation of $15, St. Louis, for metallurgical coke is being made by local producers.

Labor Trouble in Prospect

Birmingham, Ala., July 24.—Coke production in Alabama scarcely is meeting demands. Producers are unable to take on new business though it would be an easy task to sell in quantity. Prices remain firm and high, around $6 to $8 for furnace and $10 to $12 for foundry coke. The New Castle Coal Co. has 340 ovens in full operation at New Castle 20 miles from Birmingham, and every ton of coke being produced is in sharp demand. Five and six cars are being sent to Laredo, Tex., daily for shipment into Mexico. This coke is being loaded into box cars, the cost of delivery in Mexico being so high that every care must be taken to prevent transportation losses. Easiness in the coke market in other sections has had no effect on conditions in this territory. There is little apprehension that the coal and coke production in Alabama may be interfered with by a strike. The United Mine Workers of America has called a state convention at Birmingham, July 30, to formulate a wage scale. An invitation is to be extended the operators for a joint conference at which recognition of the union will be asked. Mines in Alabama for the past several years have been operated on the open shop plan and the operators oppose any change.

To Make War Supplies

Three large corporations recently have been organized in Cleveland for the production of machinery or equipment directly connected with war activities. The Salisbury Ball Bearing Co., capital $500,000, has been organized to engage in the manufacture of airplane propellers by W. M. Rohn, C. F. Walter, J. W. Eckman, N. M. Wilkinson and H. E. Chenoweth; the Inland Ordnance Co., capital $500,000, has been formed by Frank H. Ginn, T. H. Jones, R. C. Hyatt, Grover Higgins and M. N. Poe; the Weger Aeronautical Co., capital $200,000, has been chartered to make airplane motors by H. H. Brelsford, C. B. Corlett, S. G. Fleisher A. L. Hammink and L. O. Osten.

Large Extensions

Are Planned by Navy Department for Gun Factory at Washington

Washington, July 24.--Congress has been asked by Secretary Daniels to appropriate $7,500,000 to increase the capacity of the gun factory at the Washington navy yard for manufacturing guns, mounts, torpedoes, mines, telescopes, sights, optical instruments and miscellaneous ordnance supplies. Of this amount, $5,000,000 is required for buildings, craneways, storage and handling facilities, and $2,500,000 for machinery.

Secretary Daniels point out that "contracts for guns, mounts and other ordnance supplies are becoming increasingly difficult to place. Funds expended in an extension to the Washington gun factory would result in quicker return of manufactured ordnance material at a decidedly less cost and give a permanent installation of great value to the navy. Had not the navy possessed the present factory, the supply of all ordnance material would be so much less efficient than it is at present that the matter would have undoubtedly been forced to public notice.

The proposed work includes the construction of a large 6-story machine shop for mines, mounts and torpedoes, a 5-story pattern and woodworking shop, an extension to the power plant, a new brass foundry, an extension to the steel forging plant, an optical shop, range finder towers, administration building, quarters for enlisted personnel under instruction, and the extension of the yard service.

When the extensions are completed, the factory will have ample facilities for manufacturing from 300 to 900 torpedoes annually, 3000 mines monthly and additional munitions.

American Army Will Use French Field Guns

Washington, July 24.—French gun factories will supply the large field guns required by the American armies in Europe, the war department has announced. Failure to secure sufficient appropriations in previous years to enable this country's capacity to be built up to a point where it could be rapidly and adequately expanded now is assigned as the reason for depending upon French factories to supply the guns which could not be built here now without serious delay. It is pointed out that orders have been distributed to all factories in this country to the maximum capacity possible without causing interference to work for the allies. The forgings for the French-made guns will be supplied by this country and can be supplied from the accumulation which the French orders have procured from American steel plants, and can subsequently be replaced, either by an equivalent tonnage of other kinds of steel or by gun forgings from the increased capacity to be provided in the United States.

Revised List

Of Iron and Steel Products Under Export Ban Officially Announced

Washington, July 24.—The exports council which is handling the licensing of exports has been called upon for rulings regarding the effect of the President's proclamation upon certain commodities not specifically mentioned in the executive order. The articles affected in these rulings have been publicly announced. The new list, it is pointed out, "supersedes an unauthorized and incorrect statement hitherto published." Further additions may be made.

The following list includes products of interest to iron and steel manufacturers which the council has determined come under the general headings listed in the President's proclamation and for which licenses are now required: Coal, coke, fuel oils, lubricating oils, benzol, toluol, naphtha, pig iron, steel billets, steel sheet bars, steel blooms, steel slabs, ship plates and structural shapes, iron plates, I-beams, mild steel plates, rolled steel plates, steel channels, steel angles, mild steel plates—ordinary tank quality, steel beams, steel plates ⅛-inch thick or heavier, steel sheets ⅛-inch thick or heavier are classified as steel plates, steel tees and zees, structural steel shapes, boiler plates, tank plates, steel doors, steel car frames, steel towers, scrap iron and scrap steel, ferromanganese, arms, ammunition and explosives.

The reference to an "unauthorized and incorrect statement" is interesting in connection with the sudden resignation last week of Dr. Edward E. Pratt, secretary of the council and chief of the bureau of foreign and domestic commerce, a resignation that Secretary Redfield requested. Dr. Pratt is to be succeeded by B. S. Cutler who has been first assistant.

Plans Steel Foundry

A steel casting plant to be equipped with electric furnaces, will be added to the truck division of the General Motors Co., Pontiac, Mich. The foundry was designed and the construction is being supervised by H. H. Allen, General Motors Co., Detroit.

Price Fixing Talk

Has Not Affected Refractories and Demand is Heavier Than Ever

Talk of fixing prices on basic commodities by the federal government has failed to disturb the situation for refractories. Demand for fire clay products is heavier than it has been at any time in the history of the industry. Deliveries generally are becoming more deferred, some makers being unable to promise shipments in less than six months, though in some district producers report a little more liberal car supply during the past two weeks. The car shortage adversely affects the movement of material in most sections of the country. Companies working on government contracts, however, are receiving their supplies without undue delay.

Prices in Pennsylvania show no change in position, although the tendency of quotations is upward. It is not likely that any formal advances will be announced until after the restoration of more nearly normal business conditions. Several concerns are asking $55 as a minimum on Pennsylvania fire clay brick of first quality. Quotations on silica brick in the Pennsylvania, Chicago and Birmingham districts are unchanged; they range from $45 at Birmingham to $55.50 at Chicago, as a minimum. Other districts report similar price strength. Rather large quantities of magnesia brick are being sold at $160 per net ton, although the $135 figure has not been withdrawn.

Refractories

(Per 1000 f. o. b. works.)

FIRE CLAY BRICK.
(First Quality.)

Missouri-Illinois	$45.00 to 55.00
St. Louis, high grade	55.00 to 65.00
Ohio	45.00 to 50.00
Kentucky	45.00 to 55.00
New England	55.00 to 65.00

FIRE CLAY BRICK.
(Second Quality.)

Pennsylvania	$40.00 to 50.00
Ohio	37.00 to 40.00
New England	48.00 to 58.00

SILICA BRICK.

Pennsylvania	$50.00 to 60.00
Chicago	55.50 to 65.50
Birmingham	45.00 to 55.00

MAGNESIA BRICK.
(Per Net Ton.)

9 x 4½ x 2½	$135.00 to 160.00

CHROME BRICK.
(Per Net Ton.)

9 x 4½ x 2½	$125.00 to 135.00

BAUXITE BRICK.
(Per Net Ton.)

55 per cent.	$40.00 base
76 per cent.	100.00 base

Prompt Action

In Construction Expected From Shipping Board Resignations

Washington, July 24.—The President's settlement of the shipping board muddle is interpreted here as insuring prompt federal action in building ships. Despite protests to the contrary, little doubt exists that the Goethals-Denman split seriously retarded the construction of ships which the war emergency imperatively demands. Contracts for 75 ships are said to have been let during the past week or 10 days while the dispute was hottest, but undoubtedly that figure does not represent the accomplishments that a harmonious board could have secured.

The exact form in which this new activity will be expressed is not definitely known. General Goethals had prepared an ambitious plan to build two mammoth government yards fitted for turning out 400 ships of an aggregate tonnage of 2,500,000 within 18 to 24 months. He had prepared plans for commandeering tonnage now under construction and had let contracts, or was negotiating for, a total of 925 ships. Denman's insistence for detailed information on these plans is the point about which the controversy has raged for the past week.

The return of Edward N. Hurley to an important government post meets with hearty approval in most circles here. As a member and later chairman of the federal trade commission, he left the imprint of his vigorous and forceful personality here. He resigned only a few months ago from the commission to take up private business, but has sacrificed his personal desires to meet the need for pulling order out of the chaotic shipping board situation.

Bainbridge Colby is known as a Progressive, who supported the President in his campaign for re-election last fall. The introduction of two new factors into the shipping board situation is felt to have the advantage that will result from their freedom from any association with either the Goethals or Denman faction.

Completing Laboratory

The Halcomb Steel Co., Syracuse, N. Y., John A. Mathews, president and general manager, now is completing a physical testing laboratory completely equipped with machines for testing tension, torsion, impact, hardness and shear, to be used especially for conducting tests on steel to be utilized in making airplane parts. The new structure will cost about $100,000 when completed.

Locomotives Bought

By Government for Troops in France—Track Material Advanced

New York, July 24.—The United States government just has purchased 300 locomotives for use in transporting American troops in France. Of these, 150 are to be built by the Baldwin Locomotive Works and 150 by the American Locomotive Co. The Youngstown Sheet & Tube Co. has ordered 20 hoppers, 20 flats and 60 gondolas from the Pressed Steel Car Co. The Northern Pacific is understood to have placed 500 sets of center sills with the American Car & Foundry Co.

Small lots of standard rails, involving 100 to 300 tons each, have been sold during the week at $80 to $85, mill. Rails for crane runways, etc., are selling around 5c per pound.

Track Material is Advanced

Chicago, July 23.—The General American Tank Corporation has been given a contract by the Shell Co., Los Angeles, for 50 tank cars and the Canadian Car & Foundry Co. has been awarded 100 forty-ton steel frame box cars for the Temiskaming & Northwestern railroad. Railroads do not seem to be anticipating any considerable additions to their rolling stocks but are buying a fair volume of miscellaneous equipment. Track plates have advanced to 6.50c and railroad spikes to 5.25c. Angle bars are now quoted at 4c. Other track supplies remain at previous quotations.

Reports Are Premature

According to a widely circulated report, the Seaman-Sleeth Co., Pittsburgh, has been acquired by William Morris Imbrie & Co., New York. J. S. Seaman, president of the Seaman-Sleeth Co., advises that these reports are premature.

Mill Wages Advanced

The American Sheet & Tin Plate Co., effective July 1, advanced wages of its tin mill employes 14½ per cent and boosted wages of sheet mill men about 11 per cent. Wages offered by the American company are slightly higher than those paid by mills working under an agreement of the Amalgamated Association of Iron, Steel and Tin Workers.

The Non-Ferrous Metals

Copper **Lead** **Spelter** **Tin**

New York, July 24.—Trading in the metal markets during the past week has continued practically at a standstill, and prices with the possible exception of tin, have declined. Quotations have been entirely nominal. The leading producers as a whole, have refused to recognize the current market, which has been slumping off from day to day on offerings of small second hand dealers. Within the past couple of days there has been a slightly better tone in spelter as a result of a fair amount of buying by consumers and brokers, and prices have advanced approximately ½c. Nevertheless, the market is far from being in a healthy position, and until the situation becomes more settled in Washington, little buying on the part of consumers is expected. Prime western today may be quoted as fol- Louis; September, 8.50c to 8.62½c. Brass special has been in dull demand, and prompt is holding nominally at 9c to 9.25c, St. Louis.

Copper has undergone the most serious decline of any of the nonferrous metals. This situation resulted from concessions by small holders in a vain attempt to attract buyers. Large sellers remained out of the market. The market on electrolytic is holding nominally as follows: Spot, 26.25c to 26.75c, cash; August, 25.75c to 26.25c; September, 25.25c to 25.50c; and fourth quarter, 24.25c to 24.75c. Owing to lack of offerings, lake copper still may be quoted 28.50c to 29c, cash. It is thought, however, were any business to materialize, the prices would be considerably lower. Casting copper for prompt shipment is holding nominally at 26.25c to 26.75c.

Buying of lead during the past week has been virtually a dead issue. The labor situation in the Missouri mines, however, has had a somewhat stimulating effect. It is estimated that present production is running at a rate of 15,000 tons a month under normal, as a result of strike trouble, and the leading independent producer is out of the market entirely. The American Smelting & Refining Co. continues to quote 11c, New York, on current contracts. Outstanding holders now are quoting nominally as follows: July and August, 10.25c to 10.50c, St. Louis.

The tin market held steady at around 62.50c, New York, on Straits for spot shipment. Demand has been quiet, but supplies have been extremely scarce. No export shipments have been reported.

Some domestic buying of aluminum has been done. However, the aggregate tonnage has been small. There has been little export trading. The outside market may be quoted as follows: No. 1 virgin aluminum for prompt shipment, 55c to 57c; No. 1 remelted, 53c to 55c; and No. 12 remelted, 40c to 42c.

Antimony remains weak and inactive. Spot is quoted nominally 15c to 15.25c, and August and September at 15.25c, duty paid.

Progress in Making Silica Brick

Methods of Molding, Amount of Water Used, and Quality of Materials Have Important Bearing on the Durability of the Fire Brick—Various Tests Are Described

BY C. E. NESBITT AND M. L. BELL

IN THE manufacture of iron and steel, silica brick find their greatest use in the open-hearth furnace. The demand here is for a brick of high refractoriness which does not become soft or plastic at working temperatures. The silica brick fulfills these requirements in that it is refractory and does not yield to compression unless the stress is sufficient to crush it. The ability of silica brick to stand when only a small portion of the original wall is left is well illustrated in the bulkheads. This wall when built is 18 inches thick, but wears away in spots to less than 1 inch in thickness and still the brick retains its place.

In the by-product coke industry the development of the use of silica brick is interesting. Formerly a quartzite brick was used which was made of a mixture of clay and ganister. The object of the quartzite brick was to overcome the shrinkage and settling common to fire brick. Some 12 years ago silica brick were used experimentally in both beehive and by-product ovens. The experiment proved so successful that their use increased rapidly; not only did their expansion on heating produce close, well-fitting joints, as shown in Fig. 6, and overcome settling difficulties, but their better conductivity greatly reduced the coking time.

In the manufacture of silica brick in this country the raw material used is quartzite rock commonly known as ganister. The important deposits are found in Huntingdon and Blair counties of Pennsylvania, Devil's Lake region of Wisconsin, and in Alabama and Colorado. It is essential for high-grade silica brick that the ganister be hard and dense. The rock should analyze about 98 per cent silica, with 1 per cent. each of iron and alumina. The raw material is broken to convenient size, lumped into a wet pan and ground with water and lime. The degree of fineness and the amount of water is left to the judgment of the operator. This is a source of considerable variation, as it will be shown later that the degree of fineness has considerable influence on the strength of the finished brick.

Importance of Binders

The binder commonly used is lime. Two per cent has been found to give the most satisfactory results. Percentages greater than this lower the refractoriness and decrease the strength of the brick, while percentages below 1½ per cent do not give a satisfactory bond. Binders such as iron, alumina, talc, water glass and other substances have been tried with more or less success.

The amount of water necessary to produce a satisfactory working mud varies somewhat with the kind of rock used, amount of calcined material present and the method of manufacture. The percentage of moisture present is important. About 10 per cent of available moisture is the proper amount for hand-made brick. Too wet a mud will produce bricks and shapes which distort after being taken from the mold, while too dry a mud is responible for a number of very serious defects, such as unfiled corners, sponginess, improper slicking and lack of cohesion, as shown in Figs. 1 and 2, all of which tend to give a finished product of low mechanical strength, very susceptible to spall, and slag penetration.

The molding is a very critical point in the manufacture of silica brick. Improper filling of the molds, too wet or too dry a mud, improper slicking, dirty pallette boards, or careless handling, all contribute their share to the making of a defective product. The defects can largely be eliminated by close inspection and rejection of all but good bricks.

Drying of the brick after molding is accomplished either on a hot floor, heated by steam, or in tunnels heated by hot air from the kilns. Drying on the floor is naturally the slower of the two methods, four to six days being required for 9-inch brick and proportionally longer for larger shapes, while drying in tunnels may be accomplished in 18 to 24 hours. It is important that drying shall be done carefully and thoroughly, for unless the material is bone dry when placed in the kilns, fire cracks, as illustrated in Fig. 3 are apt to result.

The dried brick are set in kilns, which are usually of the down-draft type ranging in capacity from 50,000 to 150,000 bricks. It is important in setting that the bricks shall be true to shape in order that they may have a proper bearing and stack well.

From a paper presented at the Atlantic City meeting of the American Society for Testing Materials, June 26-29, 1917.

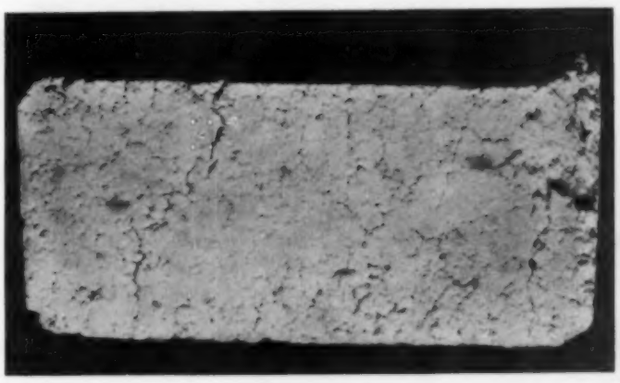


FIG. 1—AN EXAMPLE OF BAD MOLDING, POOR SLICKING AND SPONGINESS

FIG. 2—AN EXAMPLE OF BAD MOLDING AND FIRE CRACKING

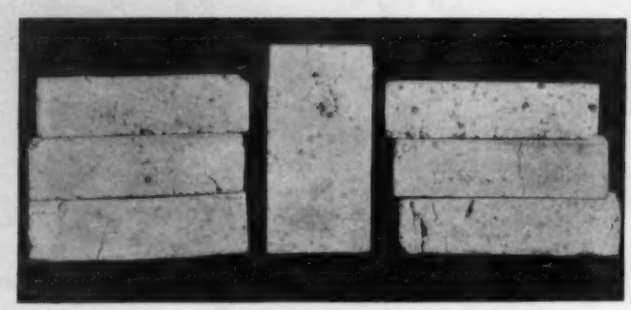


FIG. 3—CHARACTERISTIC FIRE CRACKS

FIG. 5—SPALLING TEST ON EXPERIMENTAL SERIES

Green bricks will not sustain a load of much more than 100 pounds per square inch, hence care should be taken not to overload them. Shapes should not be placed near fire boxes nor bear much weight. They are frequently boxed in.

Complete burning requires from 10 to 15 days, with a gradual increase in temperature until at least Segar cone number 16 with a melting point of 1450 degrees is attained. The final temperature must be held a sufficient length of time to thoroughly and uniformly heat the entire kiln, which may require anywhere from one to three days, depending on the size of the kiln.

The cooling usually requires about five days and is accomplished by gradually opening the fire holes and doors until the bricks are cool, when they are removed and placed directly on cars or in the stock house.

Tests of Silica Brick

In order that the degree of fineness of material and pressure might be studied an experimental series of silica brick was made with these two factors as the only variables. A good quality of Pennsylvania ganister was selected and ground dry in three lots to pass a 12, 8 and 4-mesh screen respectively. To the ground material was then added the water and lime. so as to give 9 per cent of moisture and 2 per cent of lime, From each of the above meshes standard 9-inch bricks were made on a small hydraulic press at eight different pressures varying from 187 to 2500 pounds per square inch. The

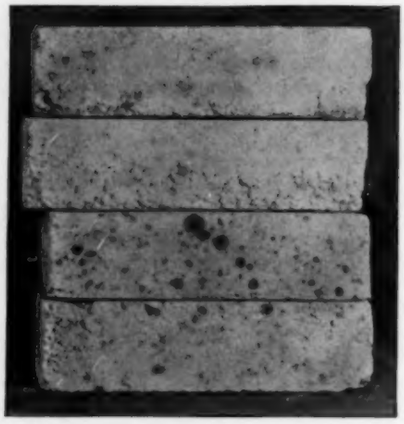


FIG. 4—COMPARISON OF HAND AND POWER-MADE BRICKS

bricks were dried, burned and cooled following regular silica-brick practice, and were then subjected to certain physical tests to determine density, resistance to impact, resistance to spall, resistance to corrosive action of slag and expansion due to heating. A summary of the results is given in Table I, which indicates that little is gained by increasing the pressure, Table II shows the results of the various pressures averaged according to mesh, and illustrates the importance of its selection.

Table I

Tests of Silica Brick Arranged According to Pressures

Pressure under which bricks were made, pounds per square inch	Apparent specific gravity	Impact, inches	Percentage spalled	Slag penetration square inches: Open-hearth slag	Slag penetration square inches: Heating furnace slag	Expansion linear inches per foot
187	1.50	47	45.5	3.48	2.28	0.155
500	1.58	46	48.3	3.68	2.42	0.155
750	1.59	60	53.2	3.63	2.41	0.158
1000	1.63	65	51.4	3.79	2.42	0.160
1250	1.65	68	47.9	3.65	2.50	0.155
1500	1.66	65	43.6	3.82	2.50	0.160
2000	1.67	67	44.8	3.64	2.45	0.159
2500	1.68	71	42.0	3.72	2.50	0.160

The machine for determining the resistance to impact consists of two vertical uprights 15 feet high, supporting two vertical and parallel 1½-inch angle irons. The angle irons are placed so that their enclosed angles face each other and are braced 3⅜ inches apart measured from the inside of the angles, so as to allow a ball 2½ inches in diameter to fall freely between them, the sidewise movement of the ball not to exceed ¼ inch. These angle irons are adjusted so that bricks of different heights may be placed under them and are marked, beginning at the lower ends, so as to clearly designate successive heights of 2 inches. The test specimen is placed directly below the angle irons on a steel block of sufficient size to give a solid foundation. The upper face of the block is perfectly smooth and at right angles to the angle irons. The block is approximately 6½ x 15 x 12 inches and weighs 332 pounds. The falling weight is a steel ball 2½ inches in diameter, weighing 2.34 pounds.

The brick to be tested is first carefully inspected and, if necessary, ground on a carborundum wheel so that it sets firmly on one of its ends. On the other end of the brick the diagonals are then drawn to locate the center. The brick is placed in a cold furnace and heated at a uniform rate from atmospheric temperature to 1350 degrees Cent. The heating as a convenience is done over night, at a uniform rate not to exceed 260 degrees Cent. per hour. The final temperature of 1350 degrees Cent. is maintained for not less than two hours.

Impact Test

The brick is then ready for the test and is placed on the steel block, so that the ball between the angle irons touches the brick at its marked center. Iron blocks are placed around the brick until they are nearly level with the top of it, to prevent sidewise movement, but the brick is not wedged. The ball is then dropped from a pair of tongs on the end of the brick at successively increasing

heights of 2 inches until the brick fractures. Any fracture radiating 1 inch or more from the point of contact of the ball is considered a fracture, and the distance in inches of the last drop is the result of the test. It will be observed that the strength as indicated by the impact test is greatest with the fine-ground material.

Preparatory to the spalling test, the furnace is heated to 540 degrees Cent. and held at this temperature for about one hour. The bricks to be tested are dried at 100 degrees Cent., weighed and then placed in the doorway of the furnace, their ends flush with the inside of the wall. In case a sufficient number of bricks are not being tested to entirely fill the doorway, the remainder of the space is filled in with other bricks to insure heating the ends only. The bricks are then heated for one hour and plunged separately into 2 gallons of water at 20 degrees Cent. to a depth of 4 inches and held there for 10 seconds. They are then removed and allowed to dry for 3 minutes in air. The bricks are then placed in the doorway of the furnace as before and the operation repeated for a total number of 10 times. They are then dried at 100 degrees Cent. for at least 5 hours and all particles which can be easily broken off with the fingers are removed. The bricks are then weighed and the percentage of loss calculated to the original weight. The percentage loss by spalling increases with fineness of mesh. Two very important properties in first-class silica brick are the mechanical strength and resistance to spalling; hence from the data we must select a mesh at the expense of one of these properties. More is gained by the coarse mesh, hence we advocate a coarse-ground material for silica brick, as shown in Fig. 5.

The average spalling loss for hand-made silica brick is about 30 per cent as compared with 25 per cent for power-pressed silica brick. From Table III it will be noted that power-pressed silica brick were made with the same spalling loss from 4-mesh material pressed at 1500 pounds per square inch. These bricks, illustrated in Fig. 4, were true to shape, sharp-cornered, dense and had smooth, marble-like surfaces. Molding defects such as soft corners, sponginess, improper slicking and lack of cohesion were all eliminated. The prospect of the adoption of power pressing as a step towards better and more uniform silica brick was clearly brought out by this series of tests. The idea of power-pressing is not entirely new, yet little has been done in a commercial way.

The brick to be tested is first carefully inspected and, if necessary, ground on a carborundum wheel so that both ends are parallel. The brick is then measured, placed in a cold furnace and heated at a uniform

Table II

Tests of Silica Brick Arranged According to Mesh

Mesh	Apparent specific gravity	Impact, inches	Percentage spalled	Slag penetration square inches: Open-hearth slag	Slag penetration square inches: Heating furnace slag	Expansion linear inches per foot
4	1.66	57	30.4	3.92	2.63	0.156
8	1.62	63	47.6	3.67	2.39	0.159
12	1.58	64	63.2	3.44	2.29	0.159

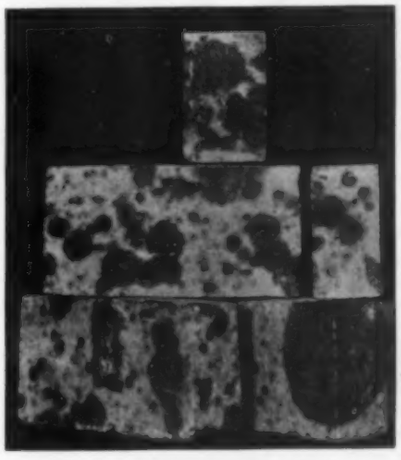


FIG. 7—DEFECTS DUE TO IRON IN RAW MATERIALS

Table III

Losses by Spalling, Expressed as Percentage

Mesh	PRESSURE UNDER WHICH BRICKS WERE MADE, POUNDS PER SQUARE INCH: 187	500	750	1000	1250	1500	2000	2500
4	21.9	34.9	37.9	38.7	31.4	30.0	19.1	29.1
8	51.6	45.9	62.6	51.0	43.3	34.8	38.3	43.3
12	62.9	64.0	59.2	64.4	69.1	65.8	67.0	53.6

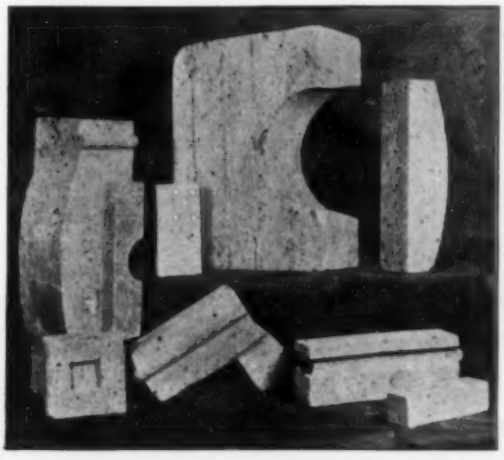


FIG. 6—A FEW OF THE DIFFICULT BY-PRODUCT COKE-OVEN SHAPES

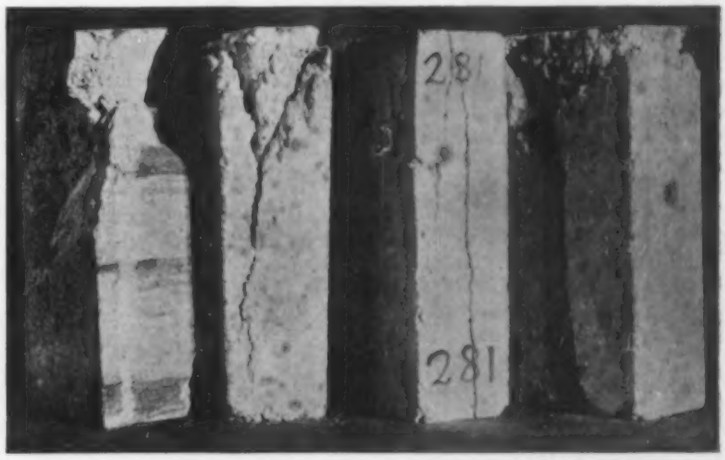


FIG. 8—CHARACTERISTIC CRUSHING TESTS

rate from atmospheric temperature to 1350 degrees Cent. The heating as a convenience is done over night at a uniform rate, not exceeding 260 degrees Cent. per hour. The total time of heating should in no case be less than six hours. The final temperature of 1350 degrees Cent. is maintained for not less than two hours. The brick is then quickly removed from the furnace and placed on end in position on the testing machine. To insure good bearing a thin piece of abestos board is placed above and below the brick. The machine is started and operated until the brick is crushed. The crushing strength is recorded in pounds per square inch.

Eliminating the Defects

In actual service, although well guarded as far as practice and construction will permit, silica brick fail from three primary causes: spalling, crushing and slagging. These cannot be entirely eliminated, as the tests show in Fig. 8, but by a deeper study of the manufacturing of brick they can be reduced to a minimum. An ideal brick must be well molded, true to shape, thoroughly bonded and of good mechanical strength.

A visual inspection of almost any shipment will show at least 20 per cent of defective brick. Six shipments of brick of different brands brought out the fact that 60 per cent of the defects were due to molding, 30 per cent to fire cracks and 10 per cent to improper setting and irregular shapes. These defects can be largely overcome in the present method of manufacture by careful inspection and rejection of the improperly made bricks at certain points in the manufacture.

The ganister must be carefully selected and sorted; all stock that is soft or which carries considerable iron, shown in Fig. 7, clay, sandstone or other foreign matter should be rejected. The ganister selected should be ground to just pass a 4-mesh screen, care being taken to avoid an excessive amount of finely ground material. To insure uniformity, frequent sieve tests of the mud should be made. To secure a sufficient bond, 1.75 to 2 per cent of lime should be used. In order to avoid irregular shapes and molding defects, 9 to 11 per cent of water should be used for hand-made bricks and the material should be pounded into the mold. The bricks should be thoroughly dried so as to avoid fire cracks when placed in the kiln. Great care should be used when heating, especially during the first part of the burn, to prevent fire cracking; this applies also to the cooling. The bricks, as they are removed from the kiln should be carefully inspected and all bricks showing molding defects, fire cracks and irregular shapes should be rejected.

The consumer should be allowed to inspect the bricks before they are loaded on the car and a place provided for storage of such brick as he may desire to test.

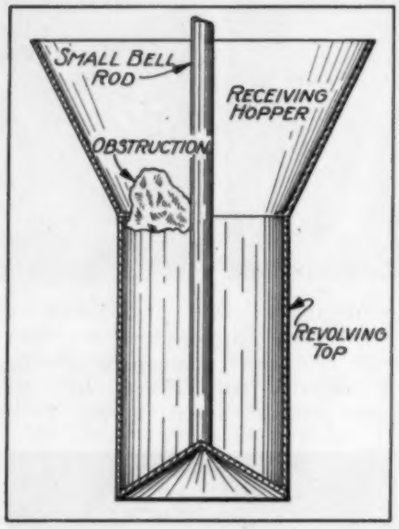


FIG. 1—SHOWING LOCATION OF OBSTRUCTION

Avoiding Clogging of Receiving Hoppers

Considerable trouble has been experienced at various skip-filled furnaces due to the receiving hopper becoming clogged. This difficulty is more noticeable during the winter months on account of the frozen condition of the stock, although it is quite possible to happen at any time when oversized lumps of ore, limestone or scrap are charged. Most of these obstructions occur at the throat of the receiving hopper where the charged material enters the mouth of the revolving top. This is probably due to the fact that oversized lumps of material lodge between the guide ring on the bottom of the receiving hopper and the little bell rod which is centrally located in the hopper and the revolving top, as shown in Fig. 1.

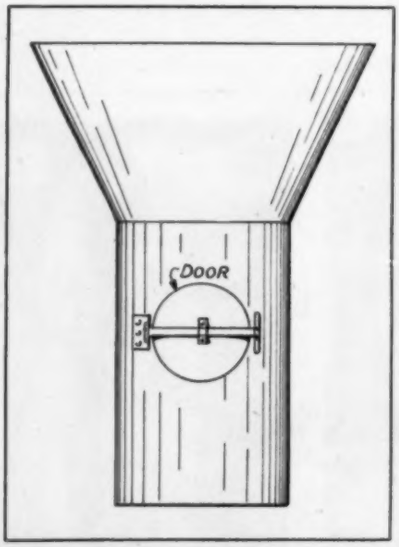


FIG. 2—LOCATION OF DOOR FOR DISLODGING CLOGGED MATERIAL IN RECEIVING HOPPER

Indications of Obstruction

It should not take the average skip man long to discover a plugged hopper. The gage rod will show whether or not the furnace is taking stock; the revolving top will refuse to rotate upon the application of power; large quantities of stock will be thrown onto the skip chute; or it may be that the returning skip does not enter the pit in its regular position. By opening both bells at once and blowing through the anchored material, quite often the obstruction is loosened. However, the more severe cloggings require a temporary shutdown to permit men to work without becoming gassed and to hold the furnace within reach.

In trying to displace the obstructive piece of material it is necessary to either remove all stock from the receiving hopper or to penetrate the mass with a sharp bar. The latter method is to be preferred in that once an opening is made, the stock will pass into the revolving top leaving the obstacle exposed. It requires some time to displace this stock due to the fact that all work must be carried on from the top of the hopper, which means that the workmen must either straddle the side of the receiving hopper or stand directly on top of the stock.

It is believed that several advantages are to be gained over the above methods by installing a door that could be opened and closed easily on the side of the revolving top, as shown in Fig. 2. In case the hopper became plugged a shut-down or a decrease in the blast would be unnecessary. The door in the revolving top could be opened permitting the men to work from the bottom without directly being exposed to the gaseous fumes. The wedged material around the obstruction could be dislodged by a long bar or a length of ¾-inch pipe which is easier to handle.

Estimate is made that the two proposed government shipbuilding yards will require about 12,000 tons of structural steel to build.

Big Tasks Face German Ironmakers

Driven to Extremities by War's Demands German Steelmakers Strive to Conserve Resources—Obtaining Satisfactory Lubricants is Great Problem—Scarcity of Raw Materials is Indicated

AN INSIGHT into the gigantic task confronting the ironmasters of Germany is afforded in the account of the proceedings of the annual meeting of the German Iron and Steel institute, held at Dusseldorf, March 4, 1917. Of unusual interest to men of the iron and steel industry is the report of Otto Peterson, secretary of the institute, on "The War Tasks of the German Iron and Steel Institute". The following is a liberal abstract of the report, as translated from the German by Sir Robert Hadfield:

Coal Supply Hampered

Among the war tasks of the institute the question of the supply of raw materials was a very wide one. More especially the supply of coal lately played an important part, above all other questions, concerning the supply of raw materials for the iron industry. Luckily it was only during the very last few months that hitches occurred which were not due to the natural conditions of our mining industry or to lack of labor, but solely attributable to difficulties of transport and to the exceedingly severe winter which completely paralyzed coal traffic on the waterways. Moreover, the extraction of lignite, which for about 10 years past has been used in increasing measure in our western industrial establishments, was greatly impeded by the frost. A more gratifying aspect than that of the coal supply is presented by the supply of iron ore during the past year, insofar as it may be considered assured under present conditions. On the other hand, the supply of manganese ore again called for further efforts, which, notwithstanding good progress realized partly by increasing the home production and partly by endeavors to utilize all manganiferous substances to the utmost extent, cannot yet be considered to have fully achieved their end. The supply of ferrosilicon promises, subject to certain reservations, to become very satisfactory in the future.

The efforts, already alluded to in the preceding report with regard to increasing the capabilities of output of the electrode works by standardization of carbon electrodes, have led to a satisfactory result through the co-operation of all circles concerned. The supply to steel works of aluminum for the deoxidation of steel, the institute has continued to act as an intermediary. The institute has also co-operated toward regulating the importation of magnesite from Austria, and will continue to exert itself in this question.

Similarly, the institute has endeavored to assist, jointly with the representative bodies of these branches of industry, in the solution of problems confronting the German manufacturers of refractory bricks, etc., and the limestone and dolomite quarries in matters concerning labor, transport, and raw material, more especially by recommending the utilization of available refractory materials lying in the occupied territories.

Reading Between the Lines

By Sir Robert Hadfield

With reference to the account of the meeting of the German Iron and Steel institute, held a short time ago in Dusseldorf, there appears to be a good deal of information to be gathered from it, especially when reading between the lines. It can hardly be imagined that the speakers at the meeting could have thought that within a short time afterwards their views would be read in this country (England), so probably they were freely expressing their opinions. In the account of these proceedings there is also apparent a fear that Germany after the war is going to lose or have her trade seriously crippled, also that she must so organize her empire as to be independent of outside supplies. It also appears to be admitted that our enemy has become aware of the fact that in the future she will not be allowed to prey upon other countries' trade, and that she recognizes what a serious difference will exist after the war, quite apart from the question of tariff or no tariff in other countries. The article indicates shortage of essential materials, as is evidenced by the urgent necessity of providing substitutes in many branches of technical requirements.

Lubricants Offer Problem

A troublesome question was the supplying of our works with suitable lubricants, especially since certain sources of oil, which seemed to be available, cannot yet be used at present. However, by the manufacture of briquettes of mineral wax, the rolling mills at least have obtained a lubricant serviceable for war time purposes, and further experiments at obtaining, in our gas-producers, so-called "low temperature tar", have led to a successful result which imperatively calls for the widest possible application of this process in practice. The importance of supplying the iron industry with lubricants in sufficient quantities has induced the association to establish, in conjunction with the Mining association of Essen and the northwestern group of the Association of German Iron and Steel Manufacturers, a department specially entrusted with the solution of the multifarious questions in the domain referred to. This so-called office for advice concerning lubricants and for the control and licensing of supplies for the Rhenish-Westphalian mining and metallurgic industry will, above all things, give advice to the works by specialists sent to the spot. The question, which was becoming serious for a time, as to how oil for large gas engines could be procured for the works may be considered to have lately been solved satisfactorily by suitable measures taken by the War Lubricating Oil Co.

Vitriol Shortage Looms

Although during the past year it was found possible to supply the wire-drawing mills satisfactorily with vitriol of copper—a task in which the institute took part under the distribution scheme—further attempts have been made at reducing the consumption of vitriol of copper, and also at the same time replacing vitriol of copper by other wire-drawing mediums, and they give good grounds for hope that perhaps a tangible result may still be attained hereafter. The measures taken for safeguarding the supply of calcium carbide led to the institute being entrusted with the distribution of this material to the western iron industry, and this function is being taken up by the institute, commencing from April 1. The necessity of measures of regulation as regards the requirements of chemical laboratories has induced the institute to offer its services with a view to facilitating the fairest possible distribution by giving its opinion on applications of laboratories for licenses for supplies of the requisite reagents, etc.

In the work which our institute had to perform for the Association of German High Grade Steel Works, it was afforded an opportunity of co-operating in the meritorious discharge of the tasks of the war raw materials supply department and of the War Metal Co., for the purpose of supplying the works

with metals for alloying. Hitherto it has been possible, partly thanks to the fortunate co-operation of our commercial U-boats, to meet the requirements of alloy metals, such as chromium, tungsten, molybdenum, etc. However, it became necessary to create quite a special organization in order to regulate the consumption of "rapid" tool steel, which organization is as yet too new to admit of forming a definite judgment. At any rate the efforts of the industry at effecting economies in the consumption of high-speed tool steel have been very successful.

Steel Question Still Paramount

An exceedingly large place among the war problems of the institute was taken by the provision of steel for the various branches of the war office and the shell factories. The statements made by the speaker on this subject showed what enormous efforts had to be made on the part of the iron industry in order to cope with the increasing demands of the army, that various organizations had to be created in order to carry out the large program drawn up, and that numerous functions fell to the share of our institute as an intermediary agency between the public authorities and the works concerned. In this connection, attempts have recently been made to relieve the additional strain to which our engineering works would otherwise have been subjected by the extra work required for the enlargements of plants —by resorting to the utilization of plants existing in the occupied territories —with regard to which measure the institute has again offered its co-operation.

Suggestions made by the institute with a view to improving the arrangements for the husbanding of the so-called economy metals have led to the result that a decentralization has been adopted as regards the preliminary examination of applications for licenses for the supply of such metals. This has fully met the expectations, more especially as the departments carrying out the tests of experiments as regards these economy metals at the works have co-operated in a whole-hearted and intelligent manner.

Copper Still Being Sought

The question of replacing copper blast furnace tuyeres by iron ones has been occupying the institute, and has led to the standardization of dimensions with a view to the more advantageous production of blast furnace tuyeres and to the extension thereof to the tuyere box as well.

Besides serving as adviser to the industry in general, the institute in many cases advised individual works who consulted it on various special questions, more particularly as regards bearing metals and substitutes for rubber and leather. Also the diversity of interpretations of the regulations concerning the traffic in economy metals led repeatedly to the intervention of the institute between the public authorities and the works. Similarly the institute was frequently requested by the authorities to investigate and give an opinion on applications for licenses for supplies of copper articles required by the works, a task which was not always easy if justice was to be done from all points of view.

The heavy work in the department for the control and licensing of supply of belting, induced the institute, in conjunction with the Mining association of Essen, to contemplate the establishment of a special branch office of this control department, similarly as done with regard to lubricants, for the district of the Rhenish-Westphalian mining and metallurgical industry, in order to be able to meet more promptly the requirements of this industry.

Effect of Feed Water on Steel

In districts where feed water for boilers contains sodium hydroxide many boiler troubles have appeared which have given no little concern to boiler users and makers. Such water is found in the central eastern part of Illinois, and in portions of other states. The engineering experiment station of the University of Illinois has just completed an investigation of this source of boiler distress, and the results are published in a bulletin by S. W. Parr. It was found that boilers using feed water containing sodium hydroxide often develop fine cracks radiating from rivet holes or extending from hole to hole. The experiments show that the effect upon the metal is to cause brittleness which makes it less capable of withstanding steam pressure and temperature changes. Among the remedies suggested is the addition of a salt having properties which cause it to react with the alkali and yield a harmless product.

The Express Traffic association has been formed by the leading express companies in order to increase the efficiency of service rendered shippers and to decrease the number of claims entered with the express companies for material lost in shipment. Several iron and steel shippers are cooperating with the association and it is hoped that eventually all shippers will lend the movement their support. To prevent losses in shipment, shippers are being asked to give all material shipped two sets of markings, one to be the customary shipping tags and the other to be a special marking to be used for emergency when the former marking becomes disfigured or lost. In the case of rivets, for example, an additional tag will be put inside the bag in addition to the tag attached to the outside. For bars, in addition to the stenciling or tagging where the section of the bar is too small to stencil, a paster or tag will be put on the bar, which will be wrapped in burlap and thus kept clean.

Must Make Up Lost Time

War and its permeation of the thoughts of all men; its appeal for supreme sacrifice and deep devotion; its need for scientific skill and organization, and its demands for both individual and collective work, were emphasized by E. W. Rice Jr., president of the American Institute of Electrical Engineers in his address at a meeting of the institute held in New York, June 27. Mr. Rice stated that our common enemy is an industrious organization and that since we are entering the war under the handicap of lost time, it has become essential for us to make use of scientific skill and organization coupled with effective utilization of our resources in combating the idle boast of our enemy that we have started too late.

Earnestly asserting that the belief given credence by some minds of the advent of a revolutionizing invention destined to quickly terminate the war is chimerical, President Rice took occasion to remark that it is cruel to permit such an idea to gain hold of the public.

Relative to the submarine problem, Mr. Rice advocated the use of common-sense methods and the employment of every known means of detection and attack in combating the peril. He characterized as "elementary" the statement that efforts should be made to provide ships in enormous numbers to replace those destroyed and necessary for increased demands, owing to the fact that "time is really the essence of the problem". He advocated the construction of cargo ships of greater speed and torpedo-resisting qualities and the improvement of docking and cargo-handling facilities.

A high speed steel alloy recently patented in Great Britain has the following composition: Carbon, 0.5 to 0.8 per cent; molybdenum, from 6 to 10 per cent; chromium, from 3 to 6 per cent; vanadium, 0.15 to 2 per cent; manganese, 0.2 to 0.4 per cent, and silicon, 0.2 to 0.4 per cent. The amount of vanadium cobalt, of which latter element from 0.5 may be lowered and partly replaced by to 3.5 per cent may be incorporated.

Causes of Defects in Steel Ingots

Composition of the Metal, Method of Teeming and Fluctuations in Casting Temperature Bear an Important Influence on the Piping of Steel Ingots—How Rejections May be Reduced

BY J. N. KILBY

A LARGE percentage of the defects in steel ingots weighing three tons or less are due to pipes, segregation, occluded slag, fluxed fireclay, lappiness or cracks. The receptacle into which the steel is cast governs the position in the ingot of the pipe cavities, and therefore the amount of the ingot which must be discarded to produce sound steel. Fluctuations in casting temperature, rate and method of teeming, percentage of silicon, manganese and aluminum influence the pipe more or less according to the type of molds used.

Wide End Mold Preferred

Steelmakers, after thorough investigation, are inclined to accept the mold with the wide end up as the one conducive to minimum pipe. The longer the ingot in proportion to its cross-sectional area the worse the trouble with the old, narrow-end-up type. This is indicated in Fig. 1. Mold type, and method of casting, should be made one of the most important points of steel specification. Fig. 2, showing an old-type ingot forged down, explains the old assumption of being able to produce "perfectly solid" ingots. After the question of mold type, one has to consider the necessity of using a feeder head, and with the exception of special steels, the use of a refractory feeder head has not been widely adopted. That it is necessary to produce the maximum of sound steel is beyond dispute. The type of feeder head does not matter a great deal, so far as reducing the pipe is concerned, provided it is of sufficient capacity adequately to feed the chill portion.

Economy of Feeder Head

The cost of production depends upon how much of the piped portion of the unfed ingot is utilized as salable steel, against the cost of the feeder head and its gain in yield. The cost of a feeder head per ton of steel varies greatly according to size of ingot and also according to type of head used. The figures and details given in Table I are from actual works costs, and are based upon piping

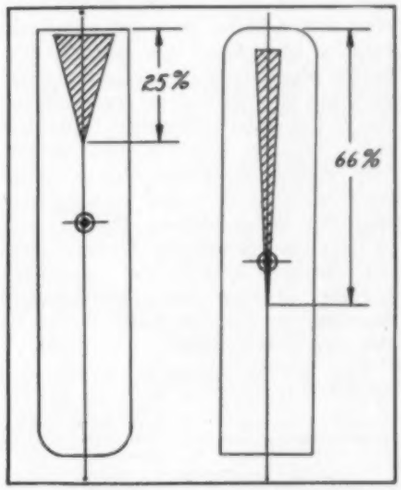


FIG. 1—DIFFERENCE IN METHODS OF POURING INGOT MOLDS SHOWING AMOUNT OF INGOT LOST IN EACH CASE WITH PIPES OF THE SAME VOLUME

steels of about 0.45 per cent carbon.

We have therefore an increased yield of 10 per cent for the cost of the feeder head, not considering the 15 per cent doubtful material used as sound. Apart from increased yield and more reliable steel, there is the great saving in the ultimate manipulation of the ingot in the rolling mills. It would appear therefore that feeder heads are economically essential even for what is termed the "ordinary steels".

Any oxide of iron admixed in steel exerts itself to a great degree upon the silicon and manganese additions just prior to tapping, and upon the aluminum after tapping, forming particles of slag. Whether these particles remain evenly disseminated throughout the mass, or whether they partly or wholly collect and rise to the surface in the slag, is a matter governed by circumstances and overshadowed by some doubt. As is well known, alloy steels and special carbon steels will not give maximum physical tests if not free from such admixtures. The author is referring to steel which was supposed to have been well melted and worked throughout and given correct finishing conditions. The presence in ordinary carbon steels of this finely divided solution of slag is just as little desired as in the case of special steels, although not so liable to influence the ordinary physical tests called for in these steels. Oxides may be taken and retained in the steel during the melting of the charge and by excessive or erratic feeding of ore.

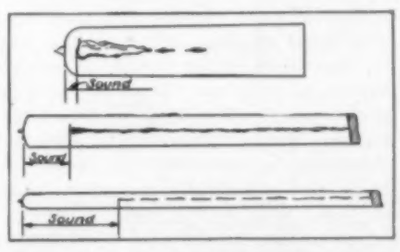


FIG. 2—OLD-TYPE INGOT FORGED TO BARS SHOWING SOLID PORTION AT TOP END WHICH IS MISLEADING TO FOREMEN INSPECTING WORK

In the author's opinion the first essential in acid open-hearth manufacture should be correct and consistent conditions at the melted stage. Importance is rightly placed upon the finishing conditions of the steel, and as these conditions are in sequence to the conditions at melting, and to a great extent governed by the latter, too much stress cannot be laid upon early stages of the heat.

Behavior of Overworked Furnace

A charge going to boil by virtue of the oxide formed during the melting-down stage is to say the least not conducive to yielding a steel free of oxides and slag inclusions. No matter what subsequent method of deoxidation be resorted to, there is great danger of a significant residual portion. A furnace working badly such as at the end of a campaign where a record run may have been sought, gives just that state of bath referred to. Slowly and cold melted charges are always highly charged with oxide. In these days of increased output and pressure upon furnace conditions and the usage of large proportions of the poorer grades of scrap, the presence of the evil is more likely to crop up than where output is of secondary importance.

The working of many and particular brands of iron in one charge had its basis of advantage unconsciously built upon silicon content, yielding regular and nearly accurate bath conditions

Presented at the annual meeting of the British Iron and Steel institute, Sheffield, Eng., May 3 and 4, 1917.

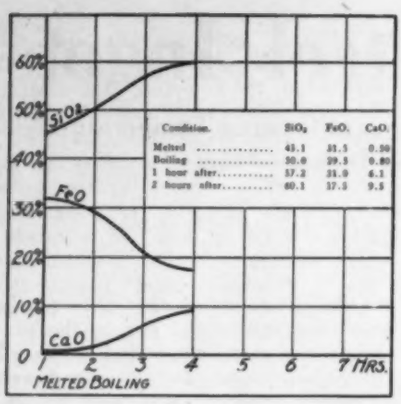


FIG. 3—RELATION BETWEEN MELTED BOILING PERIOD AND COMPONENTS OF THE CHARGE SHOWING EFFECT OF LIMESTONE —THIS IS ALSO SHOWN IN FIGS. 4, 5 AND 6

at melting. The two important factors up to the melted stage are: Quick melting and correct state of slag and bath at melting. A 2 per cent silicon basis is a good one to work to. By this is meant that the whole charge should have an available silicon content of 2 per cent, taking the silicon in the pig iron, and making the difference up by adding slag in with the charge.

Oxidation During Melting

The melting of the charge is a strongly oxidizing period, and, as previously stated, the question of what becomes of the whole of such oxide formed is a highly important one. It may be argued chemically that: Any oxide formed must naturally be reduced by carbon, silicon, and manganese in the pig iron, in contact with which the reaction would appear inevitable.

Granted, that if the correct excess of these elements was available and the conditions were suitable, the reaction as stated above would probably occur, but an acid charge in reaching the melted condition does not exhibit much sign of either violent or a milder reaction, nor does it give the impression of freeing itself energetically from oxide. It is fair to assume that, the higher the carbon and the greater the residual silicon at melting, the less the opportunity for oxide retention, also that charges requiring little or no ore to work them must be in a highly receptive state for oxide.

It is well understood that the furnace banks and bottom suffer most after heats taking little ore. One can explain why only that part of the banks which is in immediate contact with the slag should be cut or fluxed away, but this explanation does not apply to the wear of the bottom. May it not be, under certain conditions of slag bath and temperature, that the metal holding these oxides of iron is continually feeding upon the furnace hearth and producing particles of slag, and the subsequent working is only partially removing the slag thus formed.

The use of limestone in the acid open-hearth process is one of the greatest importance, as also the period at which additions should be made.

Table I

Cost of Feeder Head

Ingot without Feeder Head
Yields 15 per cent doubtful
Yields 65 per cent sound
Yields 20 per cent scrap

Ingot with Feeder Head
90 per cent sound steel
10 per cent scrap

Figs. 3 to 6 give some idea of the influence of limestone upon the chemical composition of the slag. They are taken from a number of heats and are typical of CaO effect. A highly siliceous slag low in FeO may be obtained quickly after boiling. A slag of finishing condition is formed soon after the charge has gone to boil by correct addition of limestone. If it is advantageous to work with a slag of a highly siliceous character towards the end of the boil, surely the earlier stages would be benefited by such similar conditions. The rate of fall in carbon is more regular and consistent with good results. Although the slag is apparently more mobile, it merely indicates in these circumstances a perfect state of flux and correct reaction. The question of the effect of limestone is introduced in order to raise the point of its action upon occluded slag in the bath.

The nature of the acid open hearth is one of silica and silicates of iron mostly, as shown in Fig. 7. The slag of the process is also silicates of iron and manganese, so is the nature of any occluded particles. The hearth when new is in a highly receptive state and absorbs a large quantity of the oxides formed during melting. After a few heats, however, this absorption ceases.

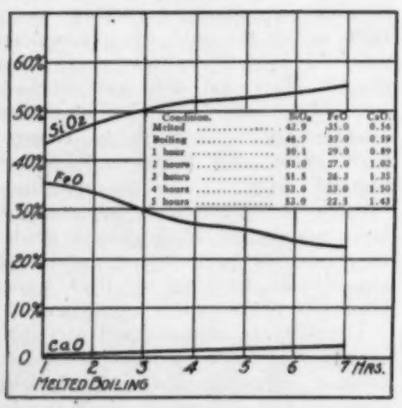


FIG. 4

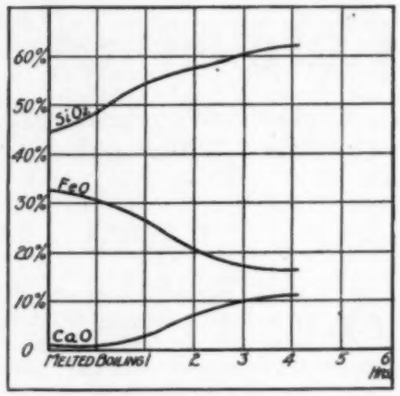


FIG. 5

Under normal conditions, therefore, we have in this process a bottom and slag of a similar composition to the occluded matter. Without the addition of CaO the slag runs about 50 per cent silica, but with correct CaO addition it may reach 62 per cent. It may be argued that a slag capable of retaining 60 per cent SiO_2, and being in a fairly mobile condition, would more readily absorb from the bath any suspended particles of slag than one low in SiO_2 and comparatively high in FeO.

Lappiness in Ingots

Bottom-cast steel poured at too low a temperature or too slow a speed tends to cause lappiness or folds in the ingot. Ordinary carbon steels, of course, do not suffer much from this condition, since if the steel is so cool as to lap badly, the chances are much against the ingots filling. Chrome steels and high silicon steels (the latter up to 2.50 per cent silicon) are almost always apt to subject themselves to lapping in a more or less degree. The appearance of the ingot

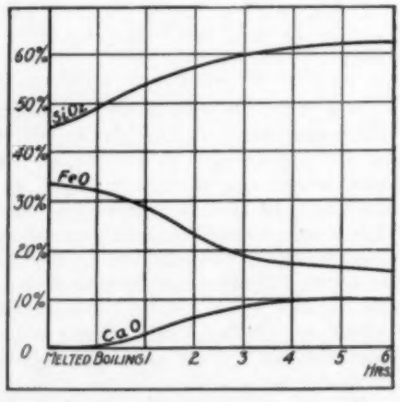


FIG. 6

may give some idea as to whether the lapping is going to be a serious defect or not, but on the whole it is a matter for further investigation. It is thought by some steelmakers that the lapped portion of the steel becomes coated with a film of oxide, which is embedded in the ingot by the flow of steel over it; also, that this forms the beginning of a flaw in the rolled bar, taking the form of a crack or split, after the bar has been subject to pickling. The author is of the opinion that any cavity or split in a rolled or forged bar has no relationship whatever with lapping in the ingot. This opinion is based upon observations of a number of nickel-chrome and chrome ingots throughout their making, and on a careful comparison of the cost of chipping out of flaws (nine in each cast separately)

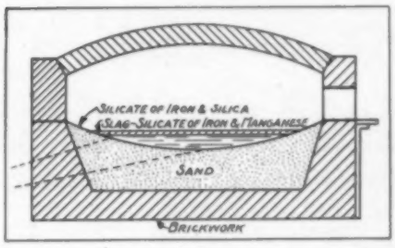


FIG. 7—SECTION OF ACID-LINED FURNACE

an erosion, the product of which is carried along into the ingot. The extent to which the erosion is carried depends mainly upon the composition of the steel and the casting temperature. It is more or less common to all bottom-cast steel.

Low-carbon steel attacks the fireclay material much more readily than the higher-carbon steels. Axle and low carbon forging material, which has to be machined and closely inspected, is subject to frequent rejection owing to the occlusions being rendered visible. Ordinary billet material, although suffering from the same evil, may escape severe notice; moreover a sandy billet may be thrown out here and there without serious loss or raising comment, the yield not being so greatly affected as where the defect shows upon a large article.

All bottom-poured steel is subject to occluded fluxed runner bricks present in the ingot in various positions, principally from the skin to a depth of a few inches. The tendency for this slag on entering the mold is to rise to the surface and toward the sides of the ingot, the flow of the steel carrying it to its final position.

Table II

Teeming Speeds of Test Ingots

RECORD OF A NUMBER OF VARIOUS SIZE TOP-POURED INGOTS FREE FROM CRACKS

Weight	Section	Time of teeming
1,500	12 inches square	2 minutes
2,500	14 inches square	2½ minutes
5,000	20 inches square	5½ minutes
6,000	22 inches square	6 minutes
8,000	24 inches octagonal	8 minutes
10,000	28 inches octagonal	9 minutes
24,000	36 inches octagonal	18 minutes
40,000	40 inches octagonal	25 minutes

40 TONS CAPACITY CAST, 0.45 PER CENT CARBON STEEL, INGOTS 2½-TON, 20 INCHES SQUARE (50 CASTS)

Time in minutes	Ingots cracked at mill	Bars to chip due to cracks
2	All badly	Nearly all
3	50 per cent	40 per cent
3½	40 per cent	30 per cent
4*	10 per cent	8 per cent
5*	5 per cent slightly	4 per cent
6*	2 per cent very slightly	2 per cent
7*	None	2 per cent

*Tun dished.

30-TON HEATS, 0.45 PER CENT CARBON STEEL, BOTTOM CAST. INGOTS 12 INCHES SQUARE, 1-INCH NOZZLE IN LADLE; (500-POUND SKULL)

Bed No.	No. of ingots per bed	Weight per bed	Time minutes	Bars to chip for cracks
1	6	9,000	4	None
2	6	9,000	4	None
3	6	9,000	3¾	None
4	6	9,000	3½	None
5	6	9,000	4	None
6	4	6,000	2	A few
7	2	3,000	1¼	All

¾-INCH NOZZLE IN LADLE; (400-POUND SKULL)

1	6	9,000	5	None
2	6	9,000	4½	None
3	5	7,500	3¾	None
4	6	9,000	4½	None
5	6	9,000	4½	None
6	4	6,000	3½	None
7	2	3,000	2	A few slightly
2	top-poured	.....	1	Nearly all

in the finished bars. Some of the best casts appeared to be the worst as regards laps, and summing up one could not say that the lapping was as serious as would be supposed. The use of comparatively large nozzles in the ladle, and a small number of ingots per bed, lead to what the author terms spasmodic teeming, the stream from the ladle running at full force being of greater volume than is compatible with correct filling of the molds. The teemer has then to use his discretion and endeavor to control the stream to fill the molds correctly. The result is an ingot teemed at various speeds and in a good many places; the stream being momentarily cut off, one would expect trouble from such teeming, which may wrongly be put down to the steel having a habit of lapping as indicated in Fig. 8.

In bottom-cast steel the flow of the metal in contact with the fireclay trumpet pipe and runner bricks causes

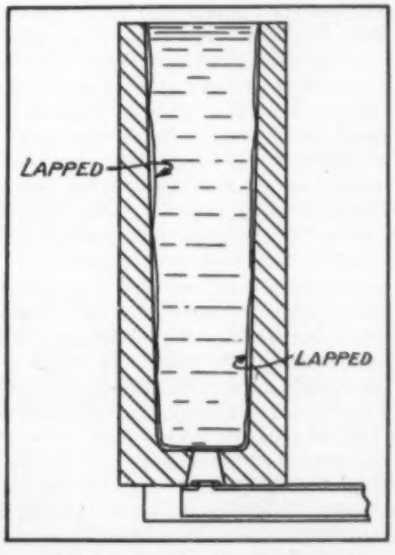


FIG. 8—AN INGOT UNEVENLY FILLED MAY CAUSE LAPS AND UNEVEN SOLIDIFICATION

Seeing that the steel in the immediate vicinity of the mold begins to solidify on contact, the fluxed runner brick has little opportunity to reach the actual face of the ingot and become merely a surface defect. Those whose duty it is to examine bars rolled from ingots having these inclusions know only too well to what depth the defect may run; unfortunately, only a proportion is so near the surface as to be observed and chipped out or the material scrapped. Apart from material actually fluxed by the flow of the steel we get the "jointing" (used in the trumpet and runner brick joints) washed off in fairly large pieces, often too large to become fused. The position taken up by these pieces of dirt is similar to that of fluxed runner. Extraneous matter such as fireclay jointing may be largely eliminated by using a suction ejector down each mold and a trumpet pipe immediately prior to casting.

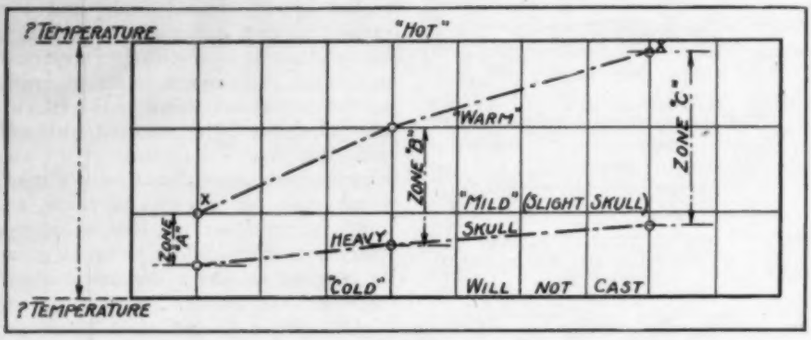


FIG. 9—CASTING CHART OF BOTTOM-CAST STEEL INDICATING EFFECTS OF POURING TEMPERATURES. TO SHOW THE COMPARATIVE SAFETY RATIOS TO CAST INGOTS WITHOUT CRACKS

Zone *A*, ladle, running at full stream, is above the capacity of the ingots on the bed and the rate of filling rests entirely with the control of the stopper by the teemer—Zone *B*, number of ingots per bed is just under the capacity of the ladle, casting at full stream—Zone *C*, nozzle size and capacity of bed balance when casting full stream, steel tending to freeze slightly on the surface during filling—Above the line *XX* cracked ingots will prevail

There are two positions in which cracks are chiefly experienced in ingots: Cross-sectional and vertical, principally at the corners of square or octagonal ingots. Around the subject of cracks there rises the point of casting, temperature, and teeming speeds. Fig. 9 illustrates the comparative margin of safety in casting ingots free from cracks under varying nozzle sizes and capacity per bed. For top-poured steel, zone *A* may be taken for direct-poured ingots against zone *C* for correctly tun-dished ingots. Fig. 10 shows a four-way, flat-bottom, circular tun dish for filling four molds at once. The value of pyrometry as a means of controling furnace or casting temperatures is unforunately very small to the steelmaker, and he has to be guided by his experience of the appearance of the furnace, slag, and spoon samples. In nine cases out of 10 one cannot talk of hot casts where a skull is left, yet ingots made from such steel will crack in working, and very badly if teemed comparatively quickly.

In a number of the works visited by the author the actual teeming times of weight of steel per minute have been little studied, and the reason for cracked ingots has invariably been attributed to heat. The only exceptions to this view have been where speed was thoroughly considered.

Discussion upon hot and mild temperatures is the casting of steel would often lead one to suppose that the actual difference in degrees of heat was extremely great. Granted that it is an easy matter, when once the steel is being cast from the ladle, to say what the temperature is like, it is a different matter accurately to judge from the furnace condition to the fine points necessary. The human element shows itself very prominently in the open-hearth steel trade, and some compromise has to be arrived at which will average all conditions and give the simplest way to success. The question of size and weight of ingot and weight of steel to be cast are all factors for consideration, as also the use and the composition of the steel.

Electrically Heated Presses

A step toward the more general application of electric heating to industrial processes recently has been taken in the adoption by the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., of electric heating for presses used in the manufacture of molded composition material. The heat is furnished by means of two plates 1 foot square and 3½ inches thick covered on their exposed surfaces with magnesia to reduce the radiation losses. The upper plate is stationary and has a thermometer inserted in a hole to indicate the temperature obtaining. The lower plate is movable vertically. Each plate is made up of two halves, in each of which there are two grooves where the heating units are placed. Thus there are four heating units to each plate, or eight per press. Each unit is 12 inches long and 2¼ inches wide, 3/16-inch thick, and is rated at 300 watts. The heating units consist of a flat ribbon resistor assembled in a mica sheath, and enclosed in a heavy steel casing. Before putting a mold into the press, the operator first has to bring the press up to operating temperature as quickly as possible. This is accomplished by turning the controller handle of the face plate to the maximum heat position, the two plates being pressed together to decrease the radiation losses as much as possible. When the proper operating temperature has been reached, the controller handle is then turned back to the position experience has shown will maintain the press at the proper temperature when used to heat molds. The lower plate is then lowered and the mold to be heated placed on it, when the lower plate is raised again. The press is then left in this position for the length of time required to heat the mold, when the lower plate is again lowered and the hot mold removed, and another cold one put in its place.

Dangers From Carbon Monoxide

In its campaign for the improvement of conditions affecting the health of persons employed in the metallurgical industries, the bureau of mines has issued a report on carbon monoxide poisoning in the steel industry. Attention is given primarily to the danger of chronic poisoning—that is, the daily exposure of employes to small quantities of this gas over an extended period of time, which, although insufficient to cause acute symptoms of intoxication, will nevertheless by insidious action finally bring about total or partial incapacitation of the worker. Rapid and serious poisoning rarely occurs except where the atmosphere is suddenly polluted with gas because of a breakdown or because of faulty operation of machinery. Such conditions are usually unforseen, soon discovered and quickly corrected. The presence of this gas in a place where men are at work, even though it be confined to the interior of manufacturing appliances and equipment, is a hazard, for experience has taught the difficulty of preventing leaks and the serious and rapid results that follow inhalation.

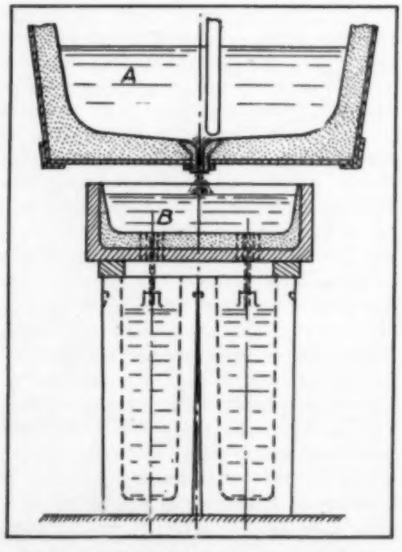


FIG. 10—FOUR-WAY, FLAT-BOTTOM, CIRCULAR TIN DISH

Blast Furnace Gas Under Boilers

A Discussion of the Economies That May Be Realized by Burning Uncleaned Gas for Steam-Making Purposes—Mixing Burners Recommended —Three-Pass Boilers Have Advantages

BY H. C. CRONEMEYER

THE following remarks apply only to the use of uncleaned blast furnace gas, the writer's experience with its use under boilers being limited to this phase of the subject.

The difficulties of keeping the boiler clean have seemed to favor the water tube boiler with vertical or steeply inclined tubes, since in these the dust carried by the gas does not deposit on the tubes in such large quantities as in a boiler with horizontal or slightly inclined tubes. In general, the simpler the disposition of tubes the better, since elaborate systems offer greater opportunity for dust to collect in places difficult of access, and a high initial efficiency of a boiler suited for clean gas or coal firing may, after a few hours' operation with dirty gas, drop below an only moderate, but better sustained performance of a simpler design. As an example of the influence of dust deposits may be cited the results of a 48-hour observation on a vertical water tube boiler, where hourly readings were taken of the temperature of the escaping gases. For the first twenty-four hours there was an approximately uniform rise of about 6 degrees Fahr. per hour, after that the temperature fluctuated over a range of about 60 degrees Fahr. as the accumulations of dust dropped off and built up again. The temperature at the end of the 48-hour period was 160 degrees Fahr. higher than when the observations commenced with clean tubes. Normally, of course, the accumulation of dust for such a long period of time, without blowing off the tubes with a steam jet, would not be permitted.

Boilers should be set singly rather than in batteries of two or more, so that they cool off more quickly for cleaning, and also be accessible from all sides. A boiler fired with dirty gas is an extremely disagreeable thing to clean, especially when not fully cooled off, and should be so designed that at least part of the cleaning operation can be performed from the exterior side of the boiler setting.

In complicated settings there are almost certain to be pockets offering opportunities for dust accumulation. If these accumulations are not removed regularly, they will bake hard, and under certain conditions will interfere with expansion and contraction to an extent that the boiler will be seriously distorted. The writer has knowledge of a case where the gradual building up of dust against a drum caused a small movement toward one side during every heating up after a shutdown, the cumulative effect of which would have pushed the drum clear off its support, had not this condition been discovered during alterations on the setting.

Moderate Sizes Favored

Boilers of rated capacities of 300 to 400 horsepower are favored for the blast furnace boiler plant. About 3,500 to 4,000 horsepower in units of this size constitutes a suitable plant for one 500-ton blast furnace operating on a normal coke consumption. A unit of the latter size can readily be hand-fired with coal by one fireman if the gas supply is cut off during the relining of a furnace, and on the other hand, the cutting out of service of one unit in a plant of the stated capacity does not impose an undue overload on the remaining boilers.

The most desirable burner is one that insures a thorough mixture of gas and air before their entry into the furnace of the boiler. The rate of combustion of blast furnace gas is relatively slow, and if the mixture of gas and air takes place only after reaching the furnace, the flame will be carried far up among the tubes. With strong draft and consequent high velocity of the gas, the cooling effect of the tubes may extinguish the flame before combustion is complete. This fact is readily apparent, if one observes the gradual change in the color of flame from a transparent rose in the combustion chamber to a dull dark red at the time of its disappearance among the tops of the tubes. If the characteristic bluish tinge of carbon monoxide is still visible at this time, it may be inferred that combustion is not complete.

Further, if the flame extends over into the second pass there may be in some types of boilers not sufficient difference in the temperatures of the two passes, to the impairment of circulation and the quality of the steam. It is this condition, as much as low efficiency when forced, which makes it inadvisable to operate boilers much above rating on this fuel.

From the foregoing it is evident that in the interest of efficiency the modern mixing burner must replace the old-style burner, through which gas and air enter in strata, with consequent delay of complete mixture, and its resultant poor combustion. When the gas pressure varies, the injector effect of a good mixing burner also helps to regulate the quantity of air drawn in with the gas, in a higher degree than does the plain burner. While the writer has not had opportunity to make personal observations on the subject, an interesting set of diagrams was furnished him by C. L. Dudley, which show this feature quite clearly. Comparison is made between a rectangular burner with central air passage, the mixture taking place in the combustion chamber of the boiler, and a well-known type of modern aspirating burner where the mixture commences within the burner. With the former there is for every variation of gas pressure an abrupt change in carbon dioxide and oxygen content of stack gases, an increase of such pressure being accompanied by a rise in CO_2 and a decrease of O. Sufficient air was admitted at all times for complete combustion and no CO was shown.

In the second burner the same tendency was also noticeable, but in a much less degree, the proportion of CO_2 and O remaining nearly constant for large fluctuations of gas pressure. Under these conditions it is possible to limit the air supply more nearly to theoretical requirements and yet obtain complete combustion, than when a variable gas supply must be burned with an almost constant air supply, as is the case when the air supply is governed only by furnace draft.

In view of the greater length of time required to develop fully the flame of blast furnace gas than that

A contribution to a topical discussion on burning blast furnace gas under boilers presented at a recent meeting of the Engineers' Society of Western Pennsylvania, Pittsburgh. The author, H. C. Cronemeyer, is in the engineering department of the Jones & Laughlin Steel Co., Woodlawn, Pa.

of coal fire, it appears that in dimensioning the furnace of a boiler using the former fuel, length is of primary importance. The cross sectional area can be relatively small, as the tendency of the flaming jet issuing from the burner is to travel by the shortest path, with little spreading out. Proceeding on this theory, we might consider the combustion chamber as the first pass of the boiler, without however, containing any tubes, so that the long flame may be nearly burned out before striking the tubes, and completely so before any still unburnt gas is chilled below the temperature of ignition. Something along this line has been obtained by building a curtain wall across the combustion chamber, compelling the flame to travel downward before rising again among the tubes. By this means a 400-horsepower boiler was operated at 145 per cent rating at good efficiency. With dirty gas this introduces a disagreeable complication in that the flue dust carried by the gas now fuses on the walls of the combustion chamber, in which condition it is, of course, much more difficult to remove than when deposited as loose dust in the bottom of the last pass, but the phenomenon clearly indicates that we are obtaining better heat utilization, since we have a higher furnace temperature.

Increasing Temperature of Combustion

Neglecting for the moment the element of installation cost, the next logical step in the attainment of higher efficiencies would be recuperative preheating of the air of combustion by the stack gases, in order to increase the temperature of combustion. Under present methods this temperature runs about 1,900 to 1,975 degrees Fahr., as compared with 2,500 to 2,700 degrees Fahr., in a coal-fired furnace. The expense of an installation of this kind would, of course, considerably exceed that of the ordinary boiler setting. A draft fan must be provided, since the interchange of heat between stack gases and air would so reduce the temperature of the former, that sufficient draft could not be obtained with a stack of normal dimensions. On the other hand, this greater cost would be more than offset by the ability to operate at largely increased capacity, since the greater heat in the gases escaping from the last pass is not lost, but is returned to the boiler in the preheated air. In case a sufficiently high furnace temperature can be reached by the above method, there would be considerable promise of success for a device now being tried out to overcome the difficulties of dirty gas without going to the expense of a gas washing plant. Briefly it consists in providing complete mixture of gas and air in a vortex furnace of ample capacity, for the attainment of a temperature that will fuse the dust and allow it to be drawn off as a liquid slag.

Favors Three-Pass Boiler

In comparing the relative merits of a two-pass or three-pass boiler, the writer favors the latter. A coal fire gives off its heat by radiation from the incandescent fuel bed as well as by contact between the tubes and the hot gases, so that the heat transfer is very rapid in the first pass and less heat absorption is required in the latter pass or passes, but in the gas-fired boiler the heat transfer is almost wholly by convection, and during the short travel through a two-pass boiler there is not sufficient time for giving off completely the sensible heat of the gases. The writer knows of an instance where the temperature of the stack gases from a two-pass vertical boiler was reduced 85 degrees Fahr. by the insertion of three tiers of cast iron horizontal baffles in the second pass, which caused the gases to zig zag across the tubes and lengthened the time of contact.

Burning coal and gas together in the same boiler furnace cannot be recommended from the standpoint of efficiency, as the draft requirements of the two fuels differ and usually the air supply to the solid fuel would be insufficient. However, a boiler foreman recently made the statement to the writer that when firing a low grade slack he found it to advantage to maintain a light gas fire at the same time. The only theory that can be offered in explanation of this fact is that the stack draft on the boilers in question does not burn the solid fuel with sufficient intensity to maintain a good stack temperature. The products of combustion from the blast furnace gas on the other hand reach the stack at a temperature which is high enough to induce a strong draft for supplying air to the coal on the grates. This method of operation is thermally efficient only as long as the gas fuel is used sparingly, so that the major portion of the air drawn into the furnace is left available for the coal.

When only the blast furnace plan proper makes demands on the steam produced from its gas, the supply of this fuel is always sufficient under normal furnace operation to make additional coal firing unnecessary, and straight gas firing suffices. But when, as is usually the case, steel works and rolling mills, as well as a power house, are included in the plant, provision must be made for coal firing also. A good system of operating the boilers ranged along the gas main is to fire gas alone in the boilers nearest the source of gas. Those farther removed, which would first feel a shortage of gas, would be adapted to use coal and gas together. During periods of normal gas production only enough coal is burned in the latter to maintain a good fuel bed, on which can be quickly built up a strong fire whenever the gas pressure weakens. Normally the ash pit doors are opened slightly to maintain a slow fire and are opened wide when the demands for steam cannot be met with gas fuel alone. The proportion of boilers adapted for both kinds of fuel to those arranged for straight gas firing is about two to one.

When plant proportions are such as to call for steam supply greater than can be developed from the number of blast furnaces in the plant, the excess must be furnished by straight coal firing which has nothing to do with the present discussion.

Clean Boilers Frequently

A boiler fired with dirty gas should be taken out of service for cleaning about every 12 to 15 days and replaced by a spare. In order that cleaning may not be delayed because another boiler happens to be off for repairs, at least one additional spare should be provided for each group that is taken as the basis for the operations of the cleaning gang.

In conclusion the writer ventures the opinion that while the gas engine no doubt will be the correct thing to install in many cases, the steam boiler joined with the highly efficient steam turbine of large size will continue to hold its own for some time to come. The possibilities of large saving in steam generation have only begun to receive attention in comparatively recent times, and when the boiler is designed, erected, and operated with the same care and skill as a high grade engine or turbine, the steam engineer need not feel any apprehension of being compelled to give way to the gas engine operator.

Hardwood base plugs for use in the manufacture of shrapnel are being manufactured in large quantities by Bogert & Hopper, 65 Barclay street, New York City, with plants located in Maine. These plugs are made from carefully selected and prepared hardwood, are slotted, threaded and boiled in parafine. They are being accepted by the United States government as standard. White metal plugs also are being manufactured.

Tayeh Iron Ore Deposits in China

The Nature and Occurrence of the Extensive Iron Ore Deposits at Tayeh Are Described—Output has Increased Until the Mines are Producing About 500,000 Tons Per Annum

BY CHUNG YU WANG

THE Tayeh iron ore deposits in China are situated to the west of the Yangtse river, being connected with the river by a standard-gage railroad, 16.16 miles in length. The general topography of the region is of mature age, showing broad valleys with sluggishly meandering streams. These deposits are worked as two mines, named the Tieh Shan mining department and the Teh Tao Wan mining department; the former consisting of three ore bodies more or less connected, named Tieh Mau Kan, Sha Mau Tze and Lung Tung, and the latter consisting of Chang Pei Shan, Sze Tze Shan, Ta Shih Men, Yeh Chih Ping and Tsin Shan, also more or less connected, as shown in Fig. 1. The deposits lie along the contact between a igneous intrusion, belonging to the hornblende-syenite group, and limestone. The hornblende syenite, invariably in a decomposed condition along the whole length of the contact, presents the appearance of a decomposed alkaline aluminum-silicate rock of a light brownish color, sometimes, though rarely, with a greenish tint to it, which is due to the greenish color of the partially decomposed hornblende. The essential minerals forming this rock, being medium-grained and of inequigranular fabric, are orthoclase and hornblende. The various stages of decomposition of the orthoclase mineral—from the fresh colorless crystals to a dull whitish kaolin product—can be clearly discerned with a field lens. It must be remarked here that there are two varieties of hornblende syenite—the one, dark gray, near the partially decomposed rock next to the orebodies; the other, mottled white, which is farther off from the deposits and can be found as boulders and pebbles along the streams. The limestone occurs in various stages of crystallization, in which hardly any trace of contact minerals can be found. I am indebted to my assistant, W. A. Wong, for having found a layer of limestone thickly studded with crystals of garnet, not far from the orebody; the only layer of limestone with such contact mineral that I saw during my stay in Tayeh.

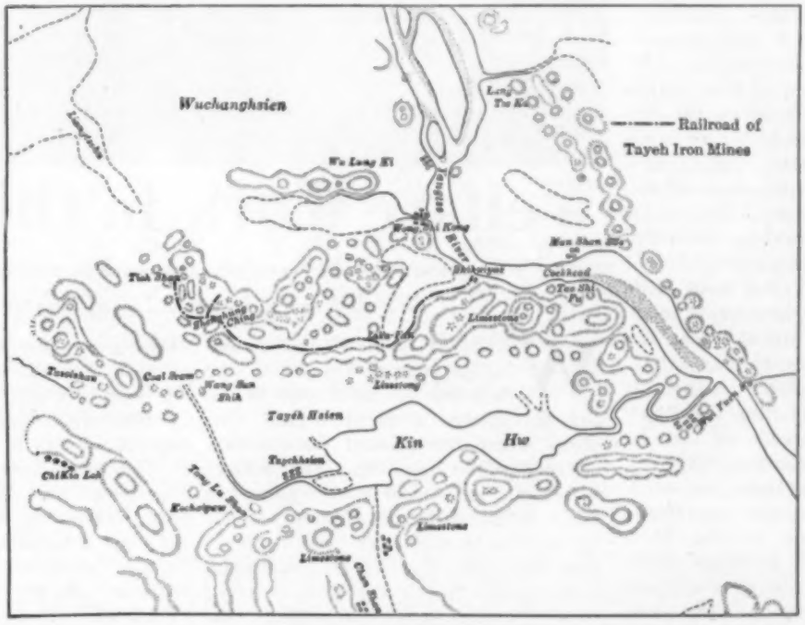


FIG. 1—MAP OF TAYEH AND SURROUNDING DISTRICT

From Fig. 1 it will be noticed that the deposits are more or less lens-shaped, having an approximate NW-SE strike and a NE dip of 60 degrees to 70 degrees, with the exception of the orebodies at Sha Mau Tze and Tsin Shan, which dip away from the igneous rock with SW dip; that is to say, the hornblende syenite forms the hanging wall, which is generally sharply distinct from the ore bodies themselves, and the limestone the foot wall, which in many places is very irregular in outline, enclosing bunchy pieces of limestone, ranging from 2 to 10 feet in diameter. The orebody at Tieh Man Kan has been faulted from the main trend of the other orebodies in a southwesterly direction. The iron ore is essentially composed of a mixture of magnetite hematite, with occasional occurrences of malachite, chalcocite and pyrite and rarely epidote and mica. Table I shows average analyses of the ore and of the limestones. Analyses of the discarded ore, dumped into the waste heap, has been found to contain as much as 1 to 5 per cent sulphur and from 0.5 to 3 per cent copper. All the orebodies are more or less jointed and the jointing planes are in a general way parallel to the hanging wall, along which is frequently found copper carbonate which must have been deposited and concentrated there from the leaching of the chalcocite found disseminated in certain portions of the orebodies.

These orebodies undoubtedly belong to the contact-deposit type and are the products of contact metamorphism and it is believed that the magnetite is primary—it has been in places partially or wholly altered to hematite, due to hydrothermal and pneumatolytic reactions, concomitant with the intrusion of the hornblende-syenite. The hematite thus originated has been carried forward by ascending telluric water, probably together with the aid of descending meteoric water, to replace metasomatically the intrusive and the limestone, especially along the contacts at certain particular spots. This is apparent from a consideration of the

An abstract of a paper to be presented at the St. Louis meeting of the American Institute of Mining Engineers, September, 1917. The author, Chung Yu Wang, is a mining engineer and geologist, Hankow, China.

Table I

Average Analysis of Ore and Limestone

Per cent.	Ore No. 1	Ore No. 2	Limestone
Fe	62.93	59.45	....
Mn	....	0.63	....
S	0.029	0.319	....
P	0.049	0.109	....
Al_2O_3	....	1.05	....
Cu	0.238	0.292	....
SiO_2	5.42	9.16	3.14
$Al_2O_3 + Fe_2O_3$	....	....	1.14
CaO	....	....	52.63
MgO	....	....	0.92
Sp. Gr.	4.64	4.13	2.71

Ore No. 1 from Teh Tao Wan.
Ore No. 2 from Tieh Shan.

facts listed in the next paragraph.

1. As noticed above, the hornblende syenite along nearly the whole length of the contact is in a decomposed and altered condition, due undoubtedly to hydrothermal and hydrometamorphism, that involves the development of kaolin and chlorite with traces of epidote, pyrite, quartz and calcite. This may be the result of the process of propylitization. 2. At Ta Shek Man, the hornblende-syenite changes to a light-brownish and yellowish color and is rather soft, with scales of sericite, distinguishable megascopically. This is probably the result of sericitization, developing prominently in this particular locality. 3. The crystallization of the limestone to marble is undoubtedly due to its contact with the hornblende-syenite magma, with the development of a banded structure in the limestone, particularly discernible at Sha Mou Tze. This banded structure may probably be due to differing degrees of silicification. 4. Near the main orebodies at Teh Man Kan, irregular smaller bodies of ore rich in manganese are found in the limestone, which must owe their origin to the same magmatic emanation. 5. The magnetite is regarded as primary and derived from magmatic emanation rich in iron, and the hematite as a secondary product from the oxidation of the magnetite. We can picture to ourselves how this process of hematization can be brought about. Chemically, magnetite is composed of the sesquioxide Fe_2O_3 which is hematite, and the protoxide FeO, which, being unstable, would readily be oxidized to Fe_2O_3 in the presence of active free oxygen under suitable pressure and temperature. Undoubtedly the gaseous vapor, during the intrusion of the syenite, furnished such oxygen. O. Silvestri has found as much as 18.97 per cent of oxygen in the gas issuing from Mt. Etna. It is generally known that chemical reaction may or may not be favored by an increase of pressure, and this is why magnetite cannot be hematized either at or near the surface, or at great depth. Probably the gaseous emanation rich in magnetite and oxygen, on coming up from below, reaches a particular zone where the pressure and temperature are suitable to the combination of the oxygen and magnetite to form hematite. 6. Some of the hematite thus produced may be carried forward by telluric water, probably aided by descending meteoric water to replace metasomatically some portion of the rocks of both the hanging wall and the foot wall.

Table II shows the output of iron ore from 1896 to 1914 inclusive, which, in round numbers, is about 3,500,000 tons. The ore in sight of these deposits, including Chang Pei Shan, which, being government property, has not yet been opened, has been estimated by three engineers to be 20, 30 and 100 million tons respectively. But according to my judgment, and due consideration to the estimators, it would not be unreasonable to regard the ore in sight as 30,000,000 tons and the probable ore in depth as 30,000,000 tons.

Table II

Production of Ore

Year.	Tons.
1896	15,933
1897	20,545
1898	36,558
1899	24,765
1900	57,201
1901	109,215
1902	84,036
1903	107,794
1904	106,378
1905	151,168
1906	185,610
1907	174,612
1908	171,934
1909	309,399
1910	343,097
1911	359,467
1912	268,685
1913	416,342
1914	488,258
Total	3,430,976

Welfare Work in the Home

Youngstown Steel Plant Organization Renders Social Service Which Aims to Improve Living Conditions

WELFARE work is fast assuming a prominent place in the industries of the United States, and particularly in the iron and steel plants where the demand for the care of employes is insistent. The welfare movement is comparatively young in this country, whereas in Europe, successful welfare bureaus have been in operation for many years. The wonderful work carried on by the proprietors of "Les Etablissements Schneider", the largest organization of steel plants in France, as described in the March 8, 1917, issue of *The Iron Trade Review*, has extended over a long period of time. During the past half century, the company has taken a personal interest in its employes and, for years, has had a wonderfully effective welfare system in operation.

The Youngstown Sheet & Tube Co., operating blast furnaces, steel works, and fabricating mills at Youngstown, O., has a remarkably effective welfare system, which is the result of the desire of the company to secure closer relations with its employes. The ramifications of the system are manifold, extending to the homes of the workmen and their families. The work, in the main, centers around the newly equipped

FIG. 1—WELL-EQUIPPED HOSPITAL OF YOUNGSTOWN SHEET & TUBE CO.

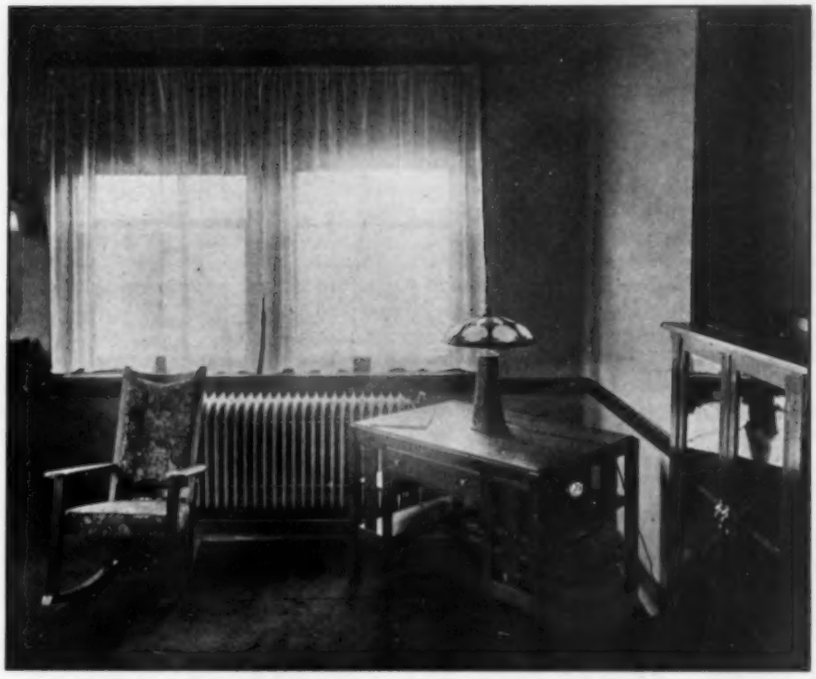


FIG. 2—CORNER IN A LIVING ROOM IN HOSPITAL

hospital, which was built for the use of the 10,000 employes of the Youngstown Sheet & Tube Co. and their families.

The welfare work is administered by three graduate nurses, whose activities are under the supervision of the company's head physician. The work of the nurses is of a dual nature, embracing both social service and visiting nursing, it being the belief of the supervising head that both may be economically and efficiently performed by selecting a proper staff personnel. The policy of the welfare department is to make home visits upon all members of the relief association who may be ill. The nurses care for all injured men who are treated at their homes, and other visits are made at the request of family physicians, relatives, or authorities in the community, as the case may be.

Work in Employes' Homes

The nurses are instructed to render such aid, while upon their visits, as the conditions seem to warrant, consequently the aid given may be either nursing or social. The direct aim of the work is to teach the cure for the conditions that call for immediate attention. The welfare department feels that its task is not completed until the applicant in question has been taught the cause, care, and cure for his ills. He is instructed in home care, sanitation, hygiene, economics and family costs. In one case of extreme improvidence, the nurses distributed the pay check until the family was out of debt and able to care for itself.

In January and February of 1917, the nurses made 411 home visits and had 87 office calls. In general, it is not the purpose of the welfare department or the hospital to give remedial relief except in cases of emergency. Rather, it is the custom to refer those cases of charity which may arise, to agencies already existing for that purpose. Cases of tuberculosis are sent to the state sanitariums, or, at times, the necessary money for a cure is loaned. All visits are charged for with a reasonably moderate fee, but where a person cannot pay, the relief is gladly furnished free.

The visiting nurses conduct an eye clinic under the direction of the company's eye specialists. Since the epidemic of trachoma a few years ago, new cases occasionally arise which require treatment. Recently, the nurses have aided the school authorities to physically examine all school children, with the result that over 1,600 defects were found in 1,100 children. It has been gratifying to know that many have followed the recommendations of the physicians and nurses and have had their defects remedied. As a result of the examination of the children, there was shown the necessity of bathing facilities, and a bath class, held on Saturdays, was instituted at once. There are about 65 children who attend this bath class each week. This welfare department with the cooperation of the Youngstown Boy Scout's organization has formed a local chapter which has a membership of 33 boys. They meet regularly and conduct themselves according to the rules of the organization. The nurses recently formed a "little mother's league", in which young girls are taught first aid, sanitation, and hygiene, as well as care of the home and children. Monthly socials are held for boys and girls, at which there is usually an attendance of about 100.

Realizing that mental development is as necessary to growth as is physical well-being, the welfare department has assisted in the organization of a night school for foreigners. Here, they learn English and those facts necessary for the completion of the examination to be American citizens. The enrollment of

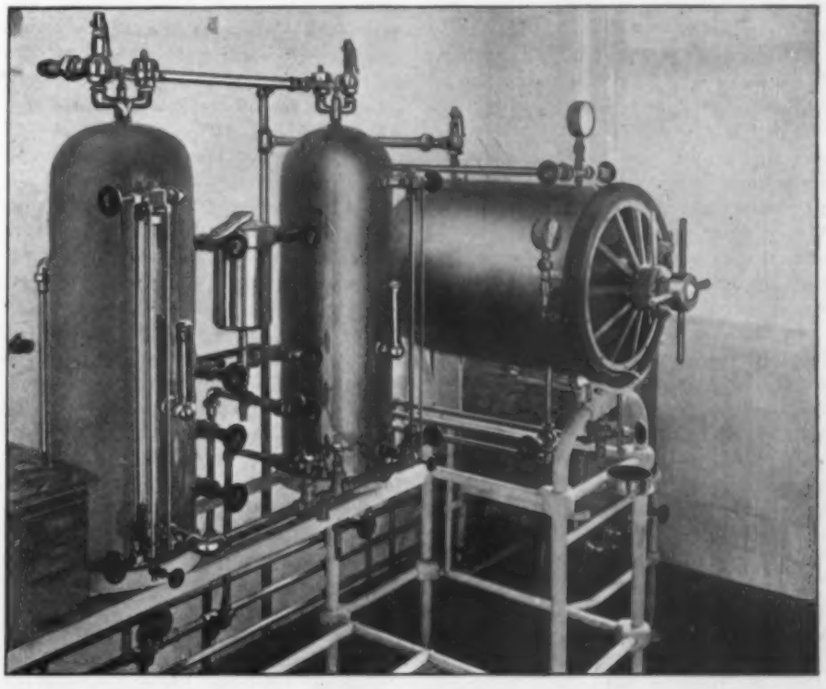


FIG. 3—A CORNER IN THE HOSPITAL FIRST-AID ROOM

this school at the present writing is over 275, and during February, 1917, there was an average attendance of 116 pupils. For those who work at night a class is conducted in the afternoon with an average attendance of 25 daily.

As already mentioned, the welfare work of the Youngstown Sheet & Tube Co. centers around the model hospital recently completed. The physicians, surgeons, and nurses have their headquarters here. The hospital is a two-story structure built of light pressed brick, with a well-lighted basement extending under the entire building. First aid treatment is extended, and minor operations are performed here. Fig. 1 shows an illustration of the hospital building. Physicians, surgeons and nurses are in constant attendance to care for patients who may be brought in, to administer first aid, and to dress the injuries of men who call for treatment.

Since all employes of the company must be examined physically, this necessitates to an extensive record system. The records of both present and ex-employes are retained on cards in filing devices, which are preserved in fireproof safes in the hospital basement. As both night and day attendance is requisite at industrial hospitals, some of the internes make their permanent quarters in the building. Fig. 2 shows one of the well furnished living rooms provided for the attendants. The hospital is equipped with good facilities for practicing modern surgery, and the apparatus includes an X-ray machine for examinations and photography, and a well appointed operating room. As illustrative of the hospital equipment, the sterilizer, in Fig. 3 is shown. This finds use for asepticizing work.

In connection with the plans for bettering the conditions for the employes, this company has formed a plan for providing homes for those who are desirous of becoming citizens and permanent residents of the community. What is called the Buckeye Land Co. has been organized for this purpose. The plans in this connection have not been fully worked out as yet, but they promise to produce effective results. To date, the company had left the housing problem to other interests, but the present conviction is that something radical had to be done to cope with the situation, hence the organization of the land company.

Summing up the work, the welfare department is in complete co-operation with all relief giving agencies, and one of its aims is to teach the people to get in touch with such agencies rather than to distribute promiscuous relief. An official of the Youngstown Sheet & Tube Co. states that the company could not get along without this department which is an added benefit and still fulfill its duty to its employes.

Magnesia Brick Works at Baltimore

An unusually fast record for the construction of a manufacturing plant of considerable size was made recently by the American Refractories Co. of Chicago, in building a new magnesia brick works in the Curtis bay district, Baltimore. This large plant consists of steel and brick storage buildings for carrying magnesite stocks, underneath which are the grinding and pulverizing machines for breaking down the material before it is conveyed to large steel bins above the grinding pans in the grinding and molding room.

The grinding and molding building houses the grinding machinery, molding machinery and electric conveyors. All of the raw materials for the different operations are handled automatically and conveyed to the different power presses and shape molding tables. After molding, all the bricks and shapes are placed on drying cars and by the use of transfer cars are conveyed to the large drying building.

In the drying building one-half is laid out for slow open drying and the other half is occupied by a long, forced dryer, operated by steam, which is generated from two separate steam units fired with the waste heat from the eight large round kilns. The burning of the magnesite brick takes place at a temperature of 3100 degrees Fahr.

The company broke ground for its Baltimore works March 1 and started to make magnesia bricks on June 25. The plant was running at capacity on July 16, turning out 30,000 magnesia bricks per day. Baltimore was selected, due to its advantage as an eastern port, in connection with its labor, freight and fuel advantages. This location at seaboard was also decided upon so the company would be in a position to receive magnesite direct from Europe after the war is over.

Magnesia bricks are used extensively in the steel and copper trade of this country. Before the European war, and in fact up to the time Italy entered the war, all the magnesite used for grain magnesite and magnesia bricks came from Europe, and while the California magnesites were well known, they were considered too pure to use. In this case, like many others of similar nature, the European war compelled the manufacturers of magnesia bricks to work out the problem of using the Grecian and California magnesite. The western magnesite is brought to the American Refractories Co.'s calcining plant at Harper, O., where it is treated, prepared and then calcined in three large rotary kilns. It is then crushed to the proper size and some of it prepared for the trade as grain magnesite, which is used in patching of the bottoms of basic open hearth furnaces. The largest proportion, however, is shipped to the Danville, Ill., works, and now to the new Baltimore works, for manufacture into magnesia bricks. The new Baltimore plant is entirely fireproof, of steel, brick and concrete construction.

Bulletin No. 9, recently issued by the American Uniform Boiler-Law society, an organization promoting the legal adoption of the A. S. M. E. boiler code, reports the progress of the society in the various states and cities of the nation. It is stated that the bill was introduced in the state of Washington, Oregon, Texas, Tennessee, Rhode Island, New Hampshire, North Dakota, Iowa, Utah and Kansas, but failed to pass. The code has been adopted, or is in the process of adoption, in the states of New York, New Jersey, Pennsylvania, Ohio, Indiana, Michigan, Wisconsin, Minnesota and California and the cities of St. Louis and Kansas City, Mo.

Suggestions to Writers

"Technical Book Writing" is the subject of a most interesting article by J. A. L. Waddell, consulting engineer, Kansas City, Mo., which points out some of the major details to be considered by the authors of scientific articles. The discussion, which was prepared by Mr. Waddell for the Society for the Promotion of Engineering Education, delves into the mechanics of technical writing and indicates the procedure of handling data preparatory to the actual writing. Although, in general, the text is concerned with the methods of preparing the manuscript for the printer and suggestions to eliminate errors and to secure satisfaction in the printed pages, the author allows himself to digress from his subject long enough to make a plea for consistency and good English. This article reprinted from the society's bulletin, contains many ideas for engineering literature.

Would Cancel Contracts

American Steel for British Consumers Being Received Slowly —Government Continues to Put Out Large Inquiries

Bureau of THE IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,
Birmingham, Eng., July 10, 1917.

IN SPITE of the great extensions of capacity, the British steel industry is unable to meet the great demands upon it. Nonwar chances of getting material are smaller by degrees. There are degrees of priority. The first and second degree offer a fair prospect to the buyer needing steel; but an order relegated to the third or fourth place has a very poor prospect of being supplied. Commercial uses for steel are in suspense—hung up, in fact, until Germany has been dealt with. The scarcity of billets is causing a good deal of inconvenience. Supplies of American steel have been worse since the American declaration of war. New business cannot be done. The few quotations received offer prices higher in New York than the government price for steel in the English works. Upon this has to be added cost of freight and shipping risks, uncertain enough, and possibly formidable. English buyers, accordingly, are bidding a wistful and reluctant farewell to American steel. They are still less happy about undelivered contracts. Some of these the American sellers have tried to cancel, but the suggestion has met with no encouragement from this side. If possible, British users will hold Americans to their bargain. They are also pressing the government to give facilities to get this contract steel over here where it is so much wanted. If any success has been had, it has not materialized yet. Wire rods are also held tightly by the government, which require knowledge of the destination and use of every rod. Wire for ordinary purposes simply cannot be had.

Government Inquiries Heavy

The government has been sending out big inquiries lately for iron and steel of nearly every description. The end of these demands, or even the diminution thereof, like the end of the war, is not in sight, and cannot be remotely approximated. A large tonnage of steel is being used for retubing and repairing guns. Automobiles, tanks, etc., are calling for large quantities of special steels. Edge tools, excavating tools, etc, naturally increase with the growth of the army. The growth of Sheffield is so rapid that difficulty is being experienced in finding accommodation for the works projected or wanted. The great demand upon electric power has also compelled the corporation of that steel center to increase its capacity.

There is talk of applying for increases upon marked bars and other descriptions of finished iron. But in view of the great reluctance shown by the ministry to make advances, the movement may come to nothing. It is understood that profits are becoming thin. But every advance under the sliding system which rules throughout the trade reacts upon wages so that every advance leaves the unlucky maker little advantage.

Pig Iron Production Grows

Northern production of pig iron is gradually overtaking demand, and it is reported that other furnaces are about to start, adding another 3000 tons weekly to the make. So far, warrant stock has not taken an upward turn, the amount in store being 1365 tons. But makers are prepared to shade prices somewhat on forge iron. There is an improvement in the exports of iron to the allies, and Scotland is also getting better attention. The case is rather different with hematite, for which an enormous demand is maintained owing to the huge employment of war steel.

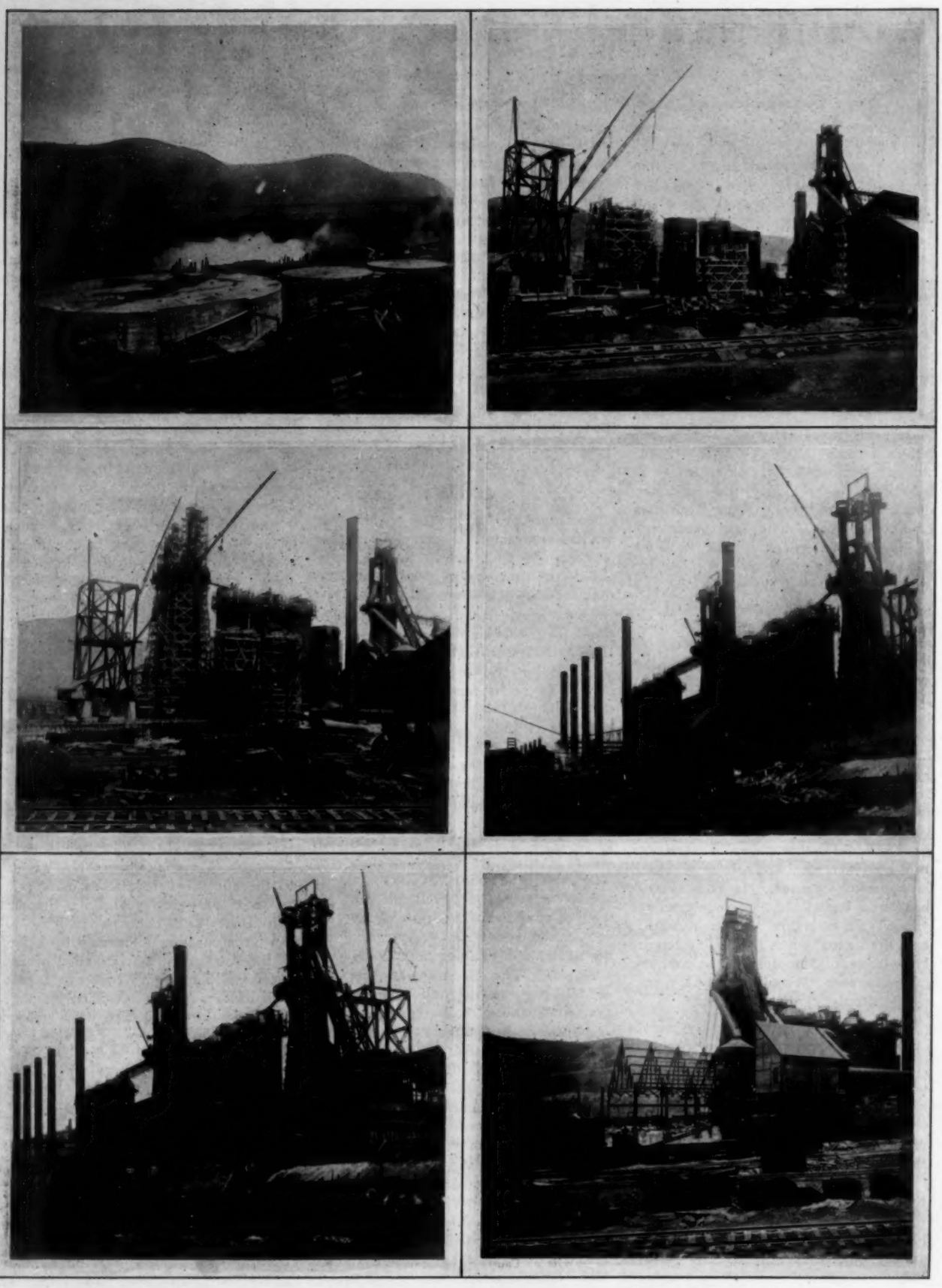
There seems no prospect that the pressure will relax, it may even increase with the vast demands for munitions and ships. The midlands are clearly not so well off for pig iron as the north of England, as sellers can dispose of every ton produced without making any price concessions. The concession of 5s ($1.20) per ton to Staffordshire makers, while those of Northamptonshire, Derbyshire, Nottingham, etc., are left out in the cold, has brought about a curious situation. The inequality of prices naturally should tend to enable the other districts to carry off some of the Staffordshire business; but the latter district claims to be selling all its make at the full new rate. Indeed, it could sell a great deal more foundry iron if it were in hand. Leading furnaces report the refusal of a great deal of foundry business which they cannot handle. The foundries are enormous buyers of iron, on account of the very large demand for shipbuilding and general engineering. The firmness of coke, of which there is no surplus, should help smelters to maintain prices, if the general market should weaken, as it may conceivably. As the government is still a large buyer for the war, there is no prospect of any diminution of demand for raw material, either for mill or foundry.

Pressing Demands of War Check Labor Trouble

Emphasizing of the need for noninterference with government work and the making of patriotic pleas, have been effective in many instances, in preventing labor disturbances. In some cases the suggestion of government requisition of plants has been productive of a more tolerant attitude on the part of employes toward mediation. Novel demands occasionally have been made. An illustration is given in the demand of molders in a New England foundry for a weekly instead of a monthly distribution of a bonus. A summary of labor disturbances of the past week in the metalmaking and metal-working industries shows the following: Strike of 400 mechanics at the plant of the George Lawley & Son Corp., Naponset, Mass., for higher wages; strike of workmen of the Skinner Chick Co., New Britain, Conn., owing to dissatisfaction over working conditions and the alleged refusal of the company to grant a 10 per cent bonus; a strike of machinists at the shipyards of the Theodore Smith Co., the Vulcan Iron Works, the Atkinson Co. and the Grimes Co., all of Jersey City, N. J.; the termination of a strike at the plant of the National Conduit & Cable Co., Hastings, N. Y., due to the efforts of federal conciliators; a strike of 2000 employes of the Standard Tin Plate Co., Canonsburg, Pa., following a meeting addressed by officers of the Amalgamated Association of Iron, Steel and Tin Plate Workers, in which complaint was made against nonunion men, and the termination of a strike at the Fort Pitt Bridge Works, Canonsburg, Pa.

Orders Large Mixers

A contract has been awarded the Pennsylvania Engineering Co., New Castle, Pa., by the Bethlehem Steel Co., for two 1300-ton mixers and three bessemer converters. The equipment will be used in connection with extensions being made by the company at its Sparrows Point, Md., plant. The contract is one of the largest ever placed with the Pennsylvania Engineering Co.



CONSTRUCTION STAGES OF THE NOS. 10 AND 11 BLAST FURNACES OF THE CAMBRIA STEEL CO. THE UPPER LEFT HAND CORNER VIEW SHOWS THE FOUNDATIONS MAY 6. IN SUCCESSION THE APPEARANCE OF THE WORK ON MAY 15, MAY 29, JUNE 12, JUNE 19 AND JULY 3 IS SHOWN

Build Furnace in 57 Days

SINCE the record-breaking construction of Cambria Steel Co.'s No. 9 blast furnace which was started March 12, 1916, and finished in 85 days, two additional furnaces, Nos. 10 and 11, with entirely new equipment, have been completed at the Franklin plant in a direct line with Nos. 7, 8 and 9 furnaces. The construction was under the supervision of J. C. Ogden, general superintendent.

The erection of No. 11 blast furnace, with its four 24 x 100-foot stoves and stack, was started May 7, 1917, on the foundation shown in the photograph on the opposite page. On July 3, the furnace was put in blast, the torch being applied by E. E. Slick Jr., son of E. E. Slick, vice president and general manager. This established the remarkable record of constructing a 500-ton blast furnace in 57 days.

The new furnaces are of the same general design as No. 9 furnace, a description of which was published in THE IRON TRADE REVIEW, June 15, 1916, page 1329. The equipment of Nos. 10 and 11 furnaces differ from that of No. 9, inasmuch as they are provided with gas washing equipment for supplying clean gas to the stoves, and in addition to this, they are blown by three 40,000 cubic feet General Electric turbo blowers, one of which is a spare. The stock is supplied to the furnaces by Otis electric skip hoists. Steam for the plant is generated by ten 768 horsepower Babcock & Wilcox boilers which are constructed so as to operate on blast furnace gas.

Munition Making

And Other Metallurgical Subjects to Come Before Institute of Metals

The tentative program for the meeting of the American Institute of Metals, to be held Sept. 25-28 at Boston, includes an imposing array of papers on technical subjects. Separate sessions will be devoted to the discussion of crucibles and furnaces, the melting and casting of nonferrous metals, casting in connection with munition making, the testing of nonferrous metals and metallography. The tentative list of papers is as follows:

Crucibles and Furnaces

"The Crucible Situation," by Prof. A. V. Bleininger, Bureau of Standards, Pittsburgh.

"Melting Yellow Brass in New Form of Induction Furnace," by G. H. Clamer, Ajex Metal Co., Philadelphia.

"The Crucible Situation," by M. McNaughton, Jos. Dixon Crucible Co., Jersey City, N. J.

"The Electric Furnace and Nonferrous Metals," by Dwight D. Miller, The Society for Electrical Development, New York City.

"My Experience with Metal Melting Furnaces," by W. H. Parry, National Meter Co., Brooklyn.

Melting and Casting Nonferrous Metals

"Casting Bearings in Sand and Metal Molds," by R. R. Clarke, Pittsburgh.

"The School End of the Job in Training Foundrymen," by C. B. Connelley, dean, Carnegie Institute of Technology, Pittsburgh.

"The Flux and Cleaner Question of Brass," by E. A. Frohman, S. Obermayer Co., Pittsburgh.

"Negative Experiments on Waste Core Sand," by Dr. H. W. Gillett, Bureau of Mines, Ithaca, N. Y.

"Pryometers—Their Construction and Application," by John P. Goheen, Brown Instrument Co., Philadelphia.

"Surface Tension and Deoxidizing of Metals," by W. J. Knox, Metals Deoxidizing & Refining Co., New York City.

"The Briquetting of Nonferrous Light Metal Scrap," by A. L. Stillman, General Briquetting Co., New York City.

"The Swelling of Zinc Base Die Castings," by H. M. Williams, National Cash Register Co., Dayton, O.

Munition Manufacture

"The Present Status of Tin Fusible Plug Manufacture and Properties," by Dr. Geo. K. Burgess, of the Bureau of Standards, Washington, D. C.

"Stellite," by Elwood Haynes, Haynes Stellite Works, Komomo, Ind.

"Fire Prevention in Large Industrial Establishments," by C. W. Johnson, Westinghouse Electric & Mfg. Co., Pittsburgh.

"The Use of Die Casting in Munitions," by Charles Pack, Doehler Die Casting Co., Brooklyn.

"A Few Points on Alloy Patents," by Wm. J. Rich, Patent Office, Washington.

"Shrapnel Bullets," by Harold J. Roast, the James Robertson Co., Ltd., Montreal.

"Recent Industrial Uses of Aluminum," by F. G. Shull, Aluminum Co. of America, Boston.

Testing Nonferrous Metals

"Some Comparative Tests on Test Bars and Actual Castings," by W. M. Corse (The Titanium Alloy Mfg. Co., Niagara Falls, N. Y.), Buffalo.

"Analysis of Babbits and Brasses," by E. W. Hagmaier, Buffalo.

"Standard Test Bars of 88-10-2 and 88-8-4, Being the Result of Co-operative Work of Six Foundries; a New Series of Tests," by C. P. Karr, Bureau of Standards, Washington.

"The Expansion Co-efficients of Alpha and Beta Brass" and "The Corrosion of Manganese Bronze Under Stress," by Dr. Paul D. Merica, Bureau of Standards, Washington.

"Corrosion of Brasses of the Muntz Metal Type," by H. S. Rawdon, Bureau of Standards, Washington, D. C.

"Analysis of Cadmium in Brass," by Dr. F. Schramm, Bureau of Standards, Washington.

Metallurgy and Metallography

"The Electrical Properties of Some High Resistance Alloys," by Prof. M. A. Hunter, Rensselaer Polytechnic Institute, Troy, N. Y., and F. M. Sebast.

"The Electrolytic Production of Antimony," by Prof. D. J. Demorest, The Ohio State University, Columbus, O.

"The Amorphous Theory in Metals," by Prof. Zay Jeffries, Case School of Applied Science, Cleveland.

"The Uses and Metallurgy of Antimony," by K. C. Li, Wah Chang Mining & Smelting Co., Inc., New York City.

"Development and Reabsorption of the Beta Constituent in Alloys Which are Normally of the Alpha Type," Prof. C. H. Mathewson, Department of Mining and Metallurgy, Yale University, New Haven, Conn., and Philip Davidson.

Alan Wood Contract for New Blast Furnace

A contract has been awarded William B. Pollock Co., Youngstown, O., by the Alan Wood Iron & Steel Co. for the plate work for a 500-ton blast furnace to be erected at Swedeland, Pa. The Alan Wood company now has two furnaces at Swedeland. The Pollock company also has received a contract from the Carnegie Steel Co. for the remodeling of two of the Edgar Thomson stacks at Braddock, Pa. It is completing a 550-ton stack for the Republic Iron & Steel Co. at Youngstown, O., and is building a modern stack for the Whitaker-Glessner interests at Portsmouth, O. A small charcoal stack for the Mysore government of India is under contract and the company is understood to have contracts for two other furnaces for that country.

Motor Trucks Awarded

Washington, July 23.—Awards have been distributed for a considerable portion of 10,000 motor trucks for the army for which bids recently were taken by the depot quartermaster at Chicago. It is expected that announcements will be made shortly bringing the total contracted for to 30,000. The awards include 3000 one and one-half-ton Jeffrey-Quad at $2805 each; 1500 three-ton Packard at $3197.37 each, and 300 three-ton Packard at $2803.81; 900 one and one-half Pierce-Arrow at $3500 each; 750 three-ton 4-wheel drive at $3248; and 400 three-ton locomobiles at $4224.57 each.

The engineer depot of the United States army at Washington will receive bids until July 25 for 150 three-ton motor trucks of commercial design.

The Enterprise Brass Foundry Co., Seattle, recently has installed the latest equipment in oil furnaces and cranes which enables it to handle some of the largest work offered in the west. The plant is filled with work for shipbuilding companies.

Steel Cost Finding Moves Slowly

Federal Trade Commission Not Likely to Complete Investigation Under Two to Three Months—Impression Grows Government Will Not Undertake Radical Price Action—Daniels Praises Patriotism of Steel Makers

WASHINGTON, July 24. — While the iron and steel industry awaits with uncertainty the result of governmental interposition, the federal trade commission is proceeding with its cost investigation as rapidly as its overworked and inadequate staff will permit. From a high authority actually at work on the steel investigation, information was received that the inquiry would consume from two to three months. This information refutes the report made last week that the results of the investigation would be announced within two to three weeks, or shortly after Aug. 1. Another authority insists that the work will be completed within the original estimate, but it is evident that the longer time will be consumed if the investigation is to be as thorough as its importance imperatively demands.

The trade commission is now at work on a number of investigations, all of which constrict the force available for the steel inquiry. Considerable difficulty is being encountered in securing competent accountants to visit iron and steel plants and examine the books in an effort to determine costs. Additional men have been put at work this week, but the number is still far below that required for a hurried but complete investigation.

Expect No Drastic Price-Fixing

The developments of the past few days have not cleared up many of the questions which iron and steel manufacturers are constantly asking. The all-important question of price and of whether the government expects manufacturers to accept a fixed scale for products furnished this government, our allies, and private consumers, remains unanswered. The impression is growing, however, that such a radical adjustment will not be requested, although the government may desire to exercise a closer supervision over prices to all consumers than had been expected. In this connection, the President's statement that "we must make the prices to the public the same as the prices to the government" is constantly referred to, but with considerable hesitation about interpreting the remark literally.

Iron and steel manufacturers will have an opportunity of learning the cost figures reached by the federal trade commission, before these are given general publicity. Confirmation of this statement was secured late last week by the correspondent of THE IRON TRADE REVIEW. The same authority pointed out that the paper manufacturers had been given a similar opportunity and had approved the figures determined by the commission. "The commission will be glad to afford steelmakers an opportunity to see the figures and to receive suggestions regarding the accuracy of its determinations," was the way in which the commission's attitude was summed up. "The costs will be determined with all possible accuracy and steel producers can rest assured of the commission's intention to be strictly fair and impartial."

How Coal is Being Handled

The conference held here last week with coal producers contains a number of suggestions as to the policy underlying the steel situation and the following summary can be profitably studied by iron and steel manufacturers. Eastern coal operators met here to discuss governmental requirements and to provide means to take care of other customers. They passed resolutions expressing their willingness to abide by such allotments as may be made by cabinet officers who are members of the council of national defense and such others lawful agencies as may be designated. Chairman Peabody pointed out that the burden imposed by the government upon a few operators who supply the coal specially adapted for the navy, must be borne by all.

Three resolutions were passed. The first provided for state committees of seven members in every coal state, these committees to supply information necessary in formulating a plan for equitably distributing any burden upon operators, shippers or consumers. The second provided that the coal production committee of the council of national defense check and compile these data and advise as to an equitable allotment. The third stated that "we reserve all rights of appeal to the court of claims. We accept such allotments as may be made by the cabinet officers who are members of the council of national defense or such agency or agencies as may be designated by lawful authority respecting coal for government use, and necessary adjustments between producers to equitably adjust the burden and cause shippers not supplying the government directly to supply their fair proportion of coal to government shippers to take the place *pro tanto* of coal furnished the government."

Any adjustments made by the President, the secretary of war or the secretary of the navy, were pointed out as being undoubtedly without the province of the Sherman antitrust law.

Commissioner William B. Colver of the federal trade commission explained that the commission would not determine the selling price of coal, but would report solely on costs. "I don't think," he said, "that the federal trade commission will set a single price during this war. I think we will try to keep our minds perfectly clear of that factor represented by profit. We have found costs in the past and the time has yet to come when at the finish over the table we laid down our figures and asked, 'Is that fair?'—any man has said 'No!'"

The operators were assured by Commissioner Colver that, in his judgment, none of them would suffer any unfair loss by working in complete accord with the government and trusting to federal settlement of price and profit. Mr. Peabody pointed out "There is no question in my mind but payment for your coal will be fair and just." He said that the more intercourse he has with the government officials, the more he is convinced that there is no desire in anyone to take advantage of any operator, business or other man.

Daniels Praises Steelmakers

Secretary Daniels said, "There are no sacrifices demanded that our people have not made; yet we are only at the beginning of our sacrifices. I do not speak of any class of Americans now because there is but one class. No man owns a coal mine or a railroad now. He is but the trustee of his property for America. Last week you saw we had two conferences with a committee from the American Iron and Steel institute and discussed one problem. And there is but one problem—that is the problem of distribution." He stated that the representatives of the great steel industry had met the representatives of the government in a spirit of "hearty Americanism."

every pound of steel in America and every ton of iron should be at the service of the government, to be used for our own government, for the allies and for whatever purposes should be necessary to win the war. And as to price—after some conversation about it—it was agreed that this is no time to discuss profits. This is a time to discuss distribution, they said, and we have faith that the government experts will be fair and just to us and that when we hand over to the government all the product of our brains we shall have a reasonable and fair profit."

Tool Builders Line Up for Aircraft Work

Washington, July 24.—The part machine tool builders will play in insuring the success of the government's comprehensive aviation program was cleared up as a result of conferences held here last week. A committee from the National Machine Tool Builders' association met with members of the aircraft production board of the council of national defense with, as a board member expressed it, "highly satisfactory results". The meetings were of a get-together nature, in order that the builders might learn the government's plans and the aircraft board learn of the builders' capacity to meet the emergency.

Discussion centered largely around the equipment required for building the engines needed in airplane construction. Preliminary surveys of the equipment of plants which are or can be adapted for building airplane engines indicate that the number of new machine tools required will be comparatively small. Special machines, such as grinders, which are required in engine building will be needed in larger numbers and the plans laid at the conferences here insure these tools being furnished in sufficient numbers to carry out the aviation program.

The aircraft board was greatly pleased with the results of the conference, which placed in the board's hands accurate knowledge of the assistance the machine tool industry can furnish. The spirit of co-operation which was shown by the builders was praised by board members after the conference.

The tool builders who attended the conference included: H. M. Lucas, Lucas Machine Tool Co., Cleveland; J. W. Carrel, general sales manager, Lodge & Shipley Machine Tool Co., Cincinnati; Charles E. Van Norman, president and general manager, Van Norman Machine Tool Co., Springfield, Mass.; Albert E. Newton, of the Reed-Prentice Co., Worcester, Mass., and the Becker Milling Machine Co., Hyde Park, Mass.; C. L. Bowers, manager, and W. C. Adams, superintendent, Henry & Wright Mfg. Co., Hartford, Conn.; George I. Alden, president, and Clayton O. Smith, sales manager, Norton Grinding Co., Worcester, Mass.; James N. Heald, treasurer and manager, Heald Machine Co., Worcester, Mass.; Ellis F. Muther, general sales manager, Gisholt Machine Co., Madison, Wis.; J. B. Doan, president, American Tool Works Co., Cincinnati; Charles H. Alvord, vice president and general manager, Hendey Machine Co., Torrington, Conn.; Henry C. Pierle, R. K. LeBlond Machine Tool Co., Cincinnati; E. P. Bullard Jr., president and John W. Bray, sales manager, Bullard Machine Tool Co., Bridgeport, Conn.; Sherman C. Shauer, vice president and general manager, Cincinnati-Bickford Tool Co., Cincinnati; E. J. Kearney, Kearney & Trecker Co., Milwaukee; Philip O. Geier, treasurer, and A. J. Baker, Cincinnati Milling Machine Co., Cincinnati; Fay Ingalls, secretary Niles-Bement-Pond Co., New York; Justus H. Schwacke, manager and secretary, William Sellers & Co., Philadelphia; Col. P. R. Hawkins, Norton Co., Worcester, Mass.; John Morton Fitzgerald, Davis Machine Tool Co., Rochester, N. Y.; Winthrop Ingersoll, Ingersoll Milling Machine Co., Rockford, Ill.; Charles E. Hildreth, president, Whitcourt-Blaisdell Machine Tool Co., Worcester, Mass.; Charles L. Taylor, Taylor & Fenn Co., Hartford, Conn.; B. B. Quillard, Ciuti Planes Co., Cincinnati; W. I. Viall, secretary, Brown & Sharpe Mfg. Co., Providence, R. I.

Howard E. Coffin, chairman of the aircraft production board, and other members participating in the conference included S. D. Walden, E. A. Deeds, H. L. Shepler, L. S. Horner and W. J. McAneeny.

Iron and Steel Control Cut From Food Bill

Washington, July 24.—The food administration bill passed the senate last week without the amendments which would have placed iron, steel, copper and aluminum under the same form of control. The elimination of these articles had been expected. The bipartisan conference of the senate leaders in charge of the bill had decided against the inclusion of these commodities and had supported the position of the President that only food, feed and fuel be included. The amendment was defeated by a vote of 50 to 27.

The scope of the bill was specifically extended to include coal and coke through an amendment proposed by Senator Pomerene of Ohio and adopted at the last minute by a vote of 72 to 12. This amendment authorizes the President, whenever he considers an emergency demands such action, to fix a reasonable price of coal and coke, whether sold by the President or by wholesale dealers; also to regulate, whenever necessary, the storage and distribution of coal and coke. The President likewise is given authority to buy coal from operators or dealers and sell it to consumers whenever he considers such action necessary.

The bill is now being taken up by conferees of the senate and house. The new coal and coke provisions probably will be retained and approved by these conferees.

Giant Aviation Program to be Pushed Through

Washington, July 24.—The government's huge aviation program is to be put into effect without delay. The senate surprised official Washington by passing the bill within an hour after the disposal of the food administration bill. No changes were made, so that only the signatures of Vice President Marshall, Speaker Clark and the President were required to give force to the measure which the house passed earlier in the week without debate.

Details of the program have been kept under cover, but it is understood that 22,000 airplanes will be built, 3500 of these in the first year. The council of national defense has been planning the advance steps necessary to line up the mechanical equipment needed in the manufacture of these airplanes, and has arranged satisfactorily for the machine tool equipment, as a result of conferences here last week with tool builders. The airplanes will be standardized as nearly as possible, so that the work of engine builders, steel producers as well as airplane manufacturing and assembling plants may be simplified as much as possible.

Extensive improvements are contemplated by the Ames Plow Co., Framingham, Mass. The foundry is to be enlarged for the manufacture of heavy castings, some of which are now being made by the Woonsocket Machine & Press Co., Woonsocket, R. I., and allied concerns. It is planned to use the foundry of the Woonsocket company for the production of castings for light textile machinery.

Men of the Iron Trade

Personal News of a Business Character Regarding the Men of Affairs of the Industry

S. H. CHAUVENET, who recently has been appointed manager of the Keystone furnace at Island Park, near Easton, Pa., recently acquired by the Northern Ore Co., is one of the best known figures in the blast furnace industry in the east. After graduating from Washington university, class of 1871, and doing post graduate work in civil engineering, he engaged in railroad work. In 1874 he was construction engineer for the Midland Blast Furnace Co. in Crawford county, Mo., and in 1875 went with the Pennsylvania Steel Co. in the capacity of engineer. He was identified with the latter until 1884 in blast furnace, open-hearth and bessemer, rolling mill, machine shop and foundry design and construction. In 1885 he became general manager of the Robesonia Iron Co., Robesonia, Pa., built a furnace for this company and operated it for seven years. At the same time he served as consulting metallurgist for the Cornwall Iron Co. Later, he became president of a Cuban iron company and of the Buena Vista Iron Co., Salem Furnace Co., Max Meadows Iron Co. and the Graham Furnace Co., all in Virginia. He also was vice president of the Virginia Development Co. and for a time he served as vice president of the Wellman Iron & Steel Co., Thurlow, Pa., and as president of the El Paso Tin Mining & Smelting Co. More recently he was for 12 years general manager of the Berkshire Iron Works, Sheridan, Pa. Mr. Chauvenet also has rendered important services as a mining engineer.

A. Goninan and A. M. Henderson, engaged in the manufacture of steel in Austria, inspected car wheel plants in the Pittsburgh district recently.

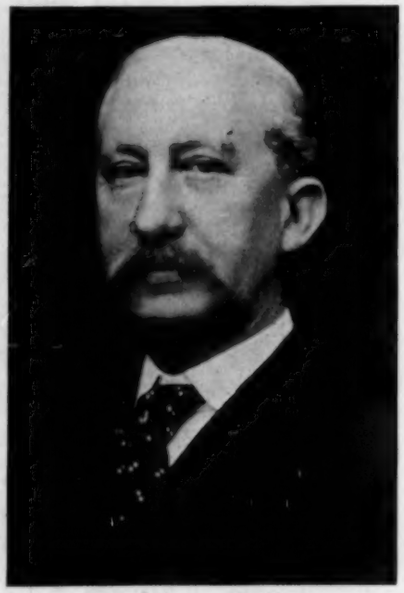
Capt. Fayette Brown of the Stewart Iron Co., Cleveland, has been commissioned as major in the Second field artillery, Ohio National Guard.

Edward T. Stuart, former treasurer of the Cambria Steel Co. and the Pennsylvania Steel Co., has been made assistant treasurer of the Girard Trust Co., Philadelphia.

B. Orum Andresen recently left for Japan to join the engineering staff of Aall & Co., Tokyo, Japanese agent for the American Steel Export Co., 233 Broadway, New York.

F. A. Beebee, formerly director of foundries of Sears-Roebuck & Co., Chicago, has been appointed foundry superintendent for the Haskell & Barker Car Co., Michigan City, Ind.

G. W. Ramsey, draughtsman and engineer for the General Fireproofing



S. H. CHAUVENET

Co., Youngstown, O., has been named a captain in the ordnance department of the United States army.

Elisha Walker has been elected a director and member of the executive committee of the Worthington Pump & Machinery Co., New York, succeeding the late George G. Henry.

G. W. Guilderman, who resigned as superintendent of the foundry of the Advance-Rumley Thresher Co., La Porte, Ind., several years ago, has returned and resumed his former duties.

C. C. Peterson, formerly affiliated with the Bridgeport Malleable Iron Co., and the Rhode Island Malleable Iron Co., has been appointed works manager of the Standard Malleable Iron Co., Muskegon, Mich.

J. A. Flood, formerly connected with the Venango Mfg. Co., Franklin, Pa., now is general manager of the Producers Supply Co., that city, which recently completed a new gray iron foundry having a daily capacity of 25 tons.

R. J. Doty, who has been in charge of the steel foundry operated by the Isaac Johnson Co., Spuyten Duyvil, N. Y., during the past three years, has resigned to become associated with the Sivyer Steel Casting Co., Milwaukee.

William A. Morgan, president of the Buffalo Copper & Brass Mills Co., Buffalo, has been chosen a director of the Curtiss Aeroplane & Motor Corp., Buffalo, succeeding George Palmer. Mr. Morgan also has been made vice president and general manager of the Curtiss company.

D. W. Figgis, formerly with the American Can Co., Chicago, has been elected president of the Smith Motor Truck Co., succeeding E. I. Rosenfeld. C. R. Hammer, formerly with the Haskell, Barker Car Co., has been elected treasurer of the company, succeeding B. C. Veatch.

S. Carroll, for many years affiliated with the National Transit Co., Oil City, Pa., in the capacity of foundry superintendent, and later with the Taylor-Wilson Mfg. Co., McKees Rocks, Pa., has been appointed foundry superintendent of George B. Limbert & Co., East Chicago, Ill.

John N. Willys, president of the Willys-Overland Co., Toledo, a voting trustee of the Curtiss Aeroplane & Motor Corp., Buffalo, has been elected president of the Curtiss company, succeeding Glenn H. Curtiss, who has been made chairman of the board of directors. Mr. Willys also was elected a member of the executive committee.

Charles A. Paquet has resigned as president of the General Car & Machinery Works, Inc., Montmagny, Que., to become general manager of the company. W. E. Patterson, whom Mr. Paquet will succeed, has been forced to resign owing to ill health. D. O. Lesperance, a director of the company, was unanimously elected president.

K. G. Martin, manager of the service and publicity departments of the

American Steel Export Co., New York, has been called to the colors. Mr. Martin recently was granted an honorable discharge from the Twenty-second regiment, corps of engineers, national guard, New York, in order to be able to accept a commission as captain in the officers' reserve corps, motor transport service. He has reported for duty at El Paso, Tex.

Fred L. Watson who for a period of 18 years up to his resignation in 1915, was treasurer of the American Steel & Wire Co., has become associated with the Federal Export Corp. and the Commercial Iron & Steel Co. and has removed from Chicago to New York. Mr. Watson has been appointed treasurer of the Commercial Iron & Steel Corp. and will act as assistant to the president of the Federal Export Corp., of New York. Mr. Watson brings to his new duties a thorough knowledge of the financial and business matters pertaining to the steel industries gained through his intimate connections with the various corporations that now form the wire branch of the United States Steel Corp. He became identified with the industry in 1880 when he joined the Baker Steel Co., Des Moines, Ia., which then began the commercial production of the Baker patent flat barbed wire. When John W. Gates made the first consolidations forming the Columbia Wire Co., Mr. Watson was brought into the company in the sales department. With the formation of the American Steel & Wire Co. of Illinois he turned his active attention to the financing and banking departments, and has devoted his energies exclusively to this branch of the steel business since.

Clifton Cooper, at one time with the Bon Air Coal & Iron Co., Nashville, Tenn., is secretary and treasurer of the new Suwanee Iron Co., with offices at Nashville, Tenn., which recently acquired the furnaces at Grand Rivers, Ky. Jacob M. Dickinson, formerly interested in the Bon Air company, and W. E. Clow of James B. Clow & Sons, Chicago, are among the stockholders of the new company.

Important Staff Changes Announced by the Iron Trade Review

C. F. WILLIAMS

L. W. MOFFETT

M. L. FEISER

SEVERAL changes in the staff of THE IRON TRADE REVIEW and associated publications of the Penton Publishing Co., including *The Daily Iron Trade and Metal Market Report, The Foundry, The Marine Review* and *Power Boating* are formally announced. C. F. Williams, who has been the resident editorial representative of THE IRON TRADE REVIEW at Pittsburgh with the title of associate editor since August, 1912, has resigned to become identified with the Allen S. Davison Co., Oliver building, Pittsburgh, in a sales capacity, and will devote his efforts to the marketing of the products of the Sharpsville furnace, Sharpsville, Pa., and the Bessie furnace, New Straitsville, O. After his graduation from the University of Illinois in 1910, Mr. Williams served on the editorial staffs of the *Cleveland Leader* and the *Cleveland News*. Following some time spent in the home office of the Penton publications in Cleveland, he was placed in charge of the editorial activities of the Pittsburgh office.

L. W. Moffett will terminate his services as Washington correspondent of THE IRON TRADE REVIEW and other Penton publications to become Mr. Williams' successor. Mr. Moffett became identified with the Penton Publishing Co. early in 1912, coming to the home office in Cleveland from Youngstown, O. One year later he was transferred to Washington and established the company's news bureau at the national capital. Except for a brief period spent at the company's offices at Pittsburgh and Chicago, he has devoted his time to a study and presentation of governmental news pertaining to the iron and steel industry and to general business. Previous to his connection with the Penton Publishing Co., Mr. Moffett was engaged in daily newspaper work for eight years in Iowa, Illinois, Wisconsin and Ohio.

M. L. Feiser, a member of the staff of *The Daily Iron Trade and Metal Market Report*, of Cleveland, has been appointed Washington correspondent of the Penton publications. Mr. Feiser was educated at Wooster college, Wooster, O., and did reportorial work on Cleveland and other Ohio newspapers before joining the Penton staff.

These several changes in the organization will become effective at an early date.

Iron and Steel Financial News

Up-to-the-Minute Fact and Comment Collected and Sifted For Busy Readers

Republic Earns Nearly Par in Quarter

A SURPLUS of $6,692,906, equal to $24.60 on common, or at the annual rate of $98.49, is shown by the Republic Iron & Steel Co. in its report on second quarter operations. In the first quarter the earnings before common dividends were $3,909,427, equal to $14.40 a share, or at the yearly rate of $57.60. The company again set aside a sum for the excess profits tax, the amount being $1,183,056, against $1,021,598 in the first quarter. The surplus for the second quarter was $9,687,333, compared with $4,143,077 a year ago. This makes the company's total surplus $27,923,584. Last year it was $12,498,030.

The comparative earnings for the first six months of 1916 and 1917 are as follows:

	First half of 1917.	1916.
*Net earnings	$15,614,524	$6,779,703
Int. and Inc.	102,229	43,323
Total profit	15,716,753	6,823,026
Dep., rents, etc.	313,287	300,327
Extra dep.	200,000	200,000
Exhaust, min.	122,290	118,171
Total deduct	635,577	618,499
Net profits	14,081,175	6,204,527
Bond interest	399,188	436,450
Ex. prof. tax	2,204,654	.....
Appl. for div.	11,477,333	5,768,077
Pref. dividends	875,000	1,625,000
Com. dividends	815,730	.....
Surplus	9,687,333	4,143,077
Prev. surp.	18,236,251	8,354,953
P. & L. surplus	$27,923,584	$12,498,030

*After deductions for maintenance and repairs.

The comparative second quarter earnings in 1917 and 1916 are as follows:

	1917 Sec. quar.	First quar.
*Net earnings	$8,778,343	$5,836,181
Other income	60,554	41,675
Total income	8,838,897	5,877,856
De., ren., etc.	160,789	152,498
Ext. dep.	100,000	100,000
Exhaust. min.	70,710	51,580
Net profit	8,507,397	5,573,778
Int. on bonds	193,935	205,253
Ex. prof. tax	1,183,056	1,021,598
Appl. for div.	7,130,406	4,346,927
Pref. dividends	437,500	437,500
Com. dividends	407,865	407,865
Surplus for quar.	$6,285,041	$3,501,561

*After deductions for maintenance and repairs.

The unfilled orders of the company June 30 aggregated 528,976 tons, a decrease of 64,042 tons from 593,018 on March 31. The unfilled tonnage on June 30, 1916, was 568,333 and two years ago, 308,016.

National Acme Gains

A gain of $953,699 over the same period in 1916 is shown in the net sales of the National Acme Co., Cleveland, for the first six months of the present year, but net profits decreased $329,880. The net sales were $9,494,733 and the net profits $2,510,002, the decrease in earnings being due to the setting aside of a fund of $400,000 for emergencies and as a provision against existing conditions. After all deductions, the profits amount to $5.47, or 21.88 per cent per $50 share annually. June monthly operating conditions increased the sales by $107,340 and the profits by $30,700, a decided improvement over the average for the six months' period. The June rate of earnings, therefore, are approximately 30 per cent yearly. Current assets in the half year increased $2.50 a share and fixed assets increased $1 a share.

Marks Mfg. Co.'s Business Increases Many Fold

Incidental to the offering of an issue of $6,000,000 of three-year 6 per cent gold notes of the Mark Mfg. Co., Chicago, a statement made by Clayton Mark, president of the company, discloses interesting facts regarding the company's operations. Established in 1888, with a capital of $5000, the company has accumulated total assets of $24,147,058, of which $5,647,058 is in plants, realty, etc.; $14,500,000 in a new plant and additions thereto, and $4,000,000 in net working capital. The new plant will consist of a 600-ton blast furnace, complete with dock, ore and coal-handling machinery, able to produce 200,000 tons of iron annually; an open-hearth department of 250,000 gross tons capacity; a 35-inch reversing blooming mill; a universal plate mill of 180,000 tons output annually; a Morgan type skelp mill; a reversing billet mill, and butt and lap pipe mills.

Summarized, the business of the company for the past six years has been as follows:

Year	Tons	Amount	Net earnings
1911	109,434	$6,115,625	$ 470,247
1912	138,967	6,799,462	667,060
1913	108,753	6,795,281	262,138
1914	130,303	5,973,805	254,347
1915	167,849	7,292,000	1,155,317
1916	170,000	9,632,095	2,222,878

Acquires Small Furnace

M. A. Hanna & Co., Cleveland, have taken over the blast furnace plant at Detroit of the Detroit Furnace Co., and will operate it in connection with the Detroit Iron & Steel Co. The plant consists of a small stack with a capacity of about 20,000 tons of pig iron annually.

Milliken Plant Conveyed for Shipyard Use

The Downey Shipbuilding Corp., 120 Broadway, has consummated the purchase of the steel fabricating plant of Milliken Bros., Inc., on Staten Island. Wallace Downey, president of the Downey corporation has paid to Lorenzo C. Dilks, president of Milliken Bros., $1,350,000 as final payment on the contract entered into several months ago. The Downey corporation took possession at once. The Downey company has a contract with the United States Emergency Fleet Corp. to build ten 7500-ton steel steamships. The company has begun work on the installation of shipbuilding ways and will make other shipbuilding additions to the plant. Shipbuilding berths will be installed ulti-

mately and of these six will be built at once. No decision has yet been reached as to the future plans of Milliken Bros., Inc.

Curtiss Airplane Backing Reach Many Millions

Buffalo, July 24.—A $5,000,000 expansion for the Curtiss Airplane Co. of Buffalo was presaged in an announcement by William A. Morgan, vice president and general manager of the firm that an approximate business of between $150,000,000 and $200,000,000 a year and the employment of 15,000 men for the remainder of the war had been practically assured. He has just returned from a visit to Washington. Options have been taken on about 54 acres, it is said, for the expansion of the business, provided the city will grant the new industry tax exemptions, etc. Ground has been broken for immediate improvements, but the rest of the property will be left unimproved until the permanency of the industry is assured.

Rolling Mill Sold

The plant of the Indiana Rolling Mill Co. has been sold to the Galesburg Coulter Disc Co., of Galesburg, Ill., for a consideration of about $500,000. A transfer of the stock was made recently to S. A. Ingersoll, a representative of the Galesburg company. Plans have been made to continue the operation of the plant.

Iron Companies Figure in Large Coal Deals

M. A. Hanna & Co. have acquired the entire anthracite coal holdings, including mines, colliers, etc., owned by the Pennsylvania railroad, which have been operated in the name of the Susquehanna Coal Co. These mines produce about 5 per cent of the entire anthracite production of the country. The sale is the result of a decision reached by the Pennsylvania railroad to dispose of all interests which are not directly a part of transportation service.

Pickands, Mather & Co., Cleveland, have sold 7500 acres of coal land in Belmont county, Ohio, to the Clarkson Coal & Dock Co., St. Paul.

Financial Crop Ends

Directors of the Lehigh Stove & Mfg. Co. Lehighton, Pa., have decided to issue bonds to the amount of $60,000, for increasing the output of the plant.

* * *

The Eastern Machine & Iron Co., Boston and Lawrence, Mass., has made an assignment to Richard H. Pierce for the benefit of its creditors.

* * *

Announcement has been made by the Toledo Furnace Co., Toledo, O., of an increase in capital from $2,000,000 to $4,000,000. Contemplated improvements will not be undertaken for a year at least.

* * *

Robert Weeks, secretary of the Reeder-Weeks Mfg. Co., Hamilton, Ont., maker of tire chains, states that the company recently has been chartered with $40,000 capital. Following are the officers of the new company: Lewis P. Reeder, president; Herbert S. Lees, vice president, and Robert Weeks, secretary and treasurer.

* * *

The $2,000,000 preferred stock issue of the Trumbull Steel Co., recently offered to common stockholders of record July 12, has been heavily oversubscribed. The company's hot-rolled strip mill and five 100-ton open hearths are fast nearing completion. The former units are scheduled to go into commission within a few weeks and the furnaces in the fall.

* * *

The New England Westinghouse Co., of Springfield, Mass., has instituted suit in the United States court at Newark, N. J., against the Crucible Steel Co. of America to recover $120,000. It is alleged that the defendant company did not keep an agreement to deliver 1,000,000 steel rifle barrels and has not returned $120,000 paid on account.

* * *

Capital increases include the American Malleable Castings Co., Marion, O., from $100,000 to $250,000; Electric Steel Co., Chicago, from $60,000 to $100,000; Decatur Pump & Mfg. Co., Decatur, Ill., from $15,000 to $25,000; Dayton Pump & Mfg. Co., Dayton, O., from $180,000 to $1,000,000; Risdon Tool & Machine Co., Naugatuck, Conn., from $50,000 to $100,000; Buffalo Pressed Steel Co., Buffalo, from $30,000 to $75,000; the Zahner Metal Sash & Door Co., Canton, O., from $600,000 to $2,000,000; the Universal Machinery Co., Milwaukee, from $25,000 to $100,000; the Vogt Bros. Mfg. Co., Louisville, Ky., from $50,000 to $250,000; the Cast Steel Foundry & Mfg. Co., Cleveland, from $10,000 to $100,000; the New Chicago Crucible Co., Chicago, from $2500 to $150,000; the Joliet Forge Co., Joliet, Ill., from $50,000 to $125,000; the Western Metals Co., Cleveland, from $10,000 to $50,000; the Crescent Forge & Shovel Co., Havana, Ill., from $100,000 to $500,000, and the Bellefontaine Bridge & Steel Co., Bellefontaine, O., from $100,000 to $150,000; the Rockbridge Manganese & Iron Co., New York, from $150,000 to $500,000; the Anderson Die Machine Co., Hartford, Conn., from $25,000 to $50,000; the American Locker Co., Albany, N. Y., from $500,000 to $700,000; the Bartlett All-Steel Scythe Co., Geneva, N. Y., from $75,000 to $250,000; the Liberty Steel Co., Warren, O., from $600,000 to $750,000; the Fulton Pit Car & Mfg. Co., Canal Fulton, O., from $150,000 to $400,000; the Evan L. Reed Mfg. Co., Oregon, Ill., from $40,000 to $60,000; the Semisteel Foundry Co., Barberton, O., from $10,000 to $100,000, and the Southern Star Graphite Co., Louisville, Ky., from $50,000 to $75,000.

Seeks Substitute

For Trinitrotoluol Owing to Shortage in Toluol Supplies for War

New York, July 21.—The difficulty in providing toluol to fill further trinitrotoluol requirements of the government has led to much discussion as to possible substitutes for the latter high explosive. Makers of toluol have disposed practically of all their output to March 1, 1918, and many contracts are for delivery up to the fall of 1918. One result of the scarcity of toluol may be the substitution of picric acid for trinitrotoluol. This, in turn, would lead to a much larger consumption of benzol and phenol. Another alternative suggested is an enlargement in the toluol output. This, however, would be difficult to carry out and would require a considerable time. Most of the toluol inquiries which have been put out by trinitrotoluol manufacturers within the past few weeks call for delivery over the latter part of 1917 and over the whole of 1918. None of them yet has been placed. Large foreign contracts involving phenol and benzol still are pending. In the meantime, the scarcity of ships to some extent is holding up shipments on old contracts. Pure benzol continues to be quoted at 55 to 60 cents per gallon, both for spot and contract, toluol at $1.75 to $2 per gallon for spot and at $1.50 to $1.75 for contract, and phenol at 38 to 40 cents per pound both for spot and contract. A number of small contracts for solvent naphtha have been closed during the week, but strength is lacking. Quotations remain at 18 to 25 cents per gallon for spot and 18 to 22 cents for contract.

Coke Oven By-Products

Spot.

Per Gallon at Producers Plant.

Pure benzol	$0.55 to .60
Toluol	1.75 to 2.00
Solvent naphtha	.18 to .25

Per Pound at Producers Plant.

Phenol	$0.38 to .40

Per 100 Pounds at Seaboard.

Sulphate of ammonia	$4.85 to 5.00

Contract.

Per Gallon at Producers Plant.

Pure benzol	$0.55 to .60
Toluol	1.50 to 1.75
Solvent naphtha	.18 to .22

Per Pound at Producers Plant.

Phenol (nominal)	$0.38 to .40

Per 100 Pounds at Seaboard.

Sulphate of ammonia	nominal.

Goethals-Denman Row Slows Market

Shipbuilding Squabble Delays New Work on Bottoms—Indecision Handicaps Tool Builders and Dealers Who Are Unable to Plan for Future Requirements—Definite Action Hoped for Shortly

INTEREST of the eastern machine tool trade continues to be centered upon the government shipping board. At present a large volume of business remains tied up as a result of the prolongation of the Denman-Goethals controversy. But with the majority of the members of the shipping board supporting General Goethals and Chairman Denman partially endorsing the general's plan to construct two fabricated steel ship plants and to take advantage, as a general proposition, of only established facilities, action at last appears not far off. This seems to be particularly true in view of the fact that President Wilson again has directed his attention to the shipbuilding row.

In the event this proposed program goes into effect, which now appears likely with possibly some few small variations, the calculations of many promoters of new shipbuilding companies, relying upon the government for assistance, will have come to naught. Dealers for some time have been in receipt of a large number of inquiries from these interests. But even with the greater part of this business out of the reckoning, sellers of machine tools feel assured that the requirements of the shipping board will be heavy. In the meantime, tool builders, aside from the discomfiture created by the present uncertainty, are in a very satisfactory position, the majority being booked ahead anywhere from six to eight months.

During the past week numerous inquiries have been received from munition makers, involving one and two tools each for replacement of old equipment. Perhaps one of the largest inquiries issued was by the General Electric Co. for equipment for its plant at Schenectady, N. Y. A large order for punching and shearing machinery has been placed with the Cleveland Crane & Engineering Co. by the Newport News Shipbuilding & Dry Dock Co. An order for a 5-ton crane has been contracted for by the Case Crane Co. for the Bullard Machine Co., Bridgeport, Conn. The Staten Island Shipbuilding Co. has placed an order with the Milwaukee Electric Crane & Mfg. Co. for a 15-ton crane. This company also is in the market for another 15-ton crane and two 50-ton cranes. The crane market generally, however, has been dull, pending developments at Washington. Little activity also has been experienced in the railroad and export business.

One development of interest to the tool trade during the past few days has been the final culmination of negotiations by which the Downey Shipbuilding Corp., 120 Broadway, New York, has acquired the steel fabricating plant of Milliken Bros., Inc., on Staten Island. The plant will be converted as soon as possible into a shipbuilding yard capable of turning out 100,000 tons of standardized steel ships a year.

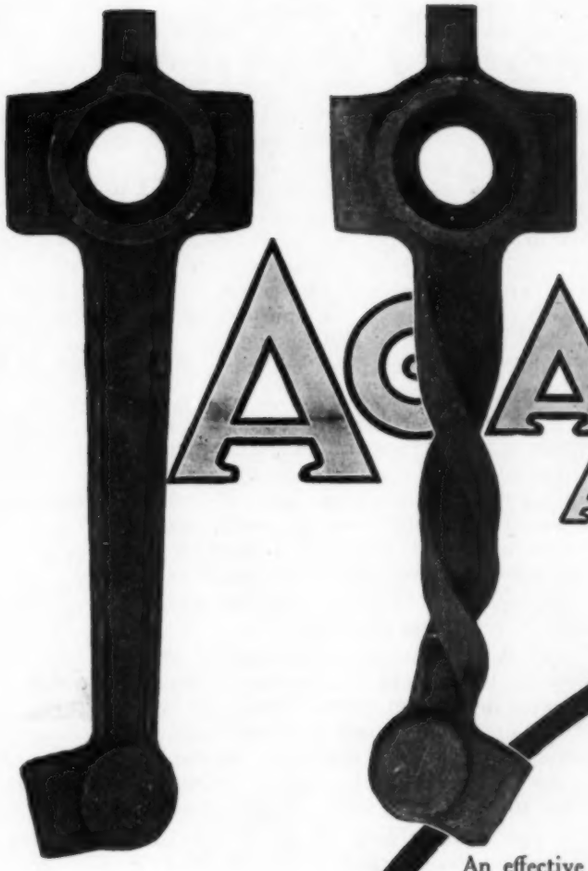
Heavy Tools at Premium in Chicago

A FAIR volume of business is reported by Chicago dealers of machine tools, but no large inquiries and few sales of gross importance have been closed. The Linderman Machine Co., Muskegon, Mich., is still in the market for horizontal and vertical boring mills and slotters. The American Can Co. has about completed its purchase of tool room equipment which it desired for the production of gigs and fixtures and is now searching the market for large shell-making equipment. A contract for valves said to emanate from government shipbuilders has been awarded to the Edward Valve Co., Chicago, and that company is in the market for boring mills. One dealer has received inquiries from shipbuilders for shipbuilding equipment including pipe machines, bolt cutters, punches and shears. Some few tools are being inquired for by various manufacturers of agricultural implements, principally those who are manufacturing farm tractors and kindred equipment.

A report has been received by local interests that the Westinghouse, Church, Kerr Co. and the Stone & Webster Co. are looking for tools for the new plants being erected at the Rock Island arsenal. This equipment will be used for the production of field pieces and hand grenades. The quartermaster has not issued an official list for this equipment yet, and it is understood that the contractors will purchase all necessary equipment. Reports of huge government contracts placed recently with manufacturers in the Chicago territory for army trucks are given much credit and are stimulating much interest. Among the companies mentioned as receiving contracts are the Four-Wheel Drive Co., Clintonville, Wis., and the Nash Motors Co., Kenosha, Wis.. It is expected the firms receiving such orders will enlarge their plants to provide for increased production. Interest has been aroused by reports of two companies organized recently to manufacture field pieces. These companies it is said will start immediately to erect and equip large plants. Comparatively little buying and selling of second-hand equipment is reported. Manufacturers who have completed foreign contracts for time fuses and small shrapnel are disposing of their equipment and such tools are plentiful. Equipment for the production of large shells is scarce and is held at a premium.

Mechanics Are Scarce in Pittsburgh

BUILDERS of heavy rolling mill equipment and machine tools in the Pittsburgh district are finding it increasingly difficult to meet specifications for delivery, on account of the scarcity of skilled mechanics. The Westinghouse interests are combing the country for men familiar with the operation of munition-making equipment. Several attractive inquiries for machine tools have been sent out by concerns who have received contracts for munitions from the government. A number of contracts for mill equipment have been placed. The Pennsylvania Engineering Co., New Castle, Pa., will furnish two 1300-ton metal mixers and three bessemer converters for the Sparrows Point plant of the Bethlehem Steel Co. The Brown Hoisting Machinery Co., Cleveland, has received a contract for a large ore bridge for the



AGATHON ALLOY STEELS

An effective test for a connecting rod is here illustrated.
For a rod to stand such a test without fracturing is proof positive that it has the right stuff in it.
The rod used in this "before and after" demonstration was forged from "AGATHON" TYPE AA CHROME VANADIUM by

The Anderson Forging & Machine Co.
Detroit, Michigan

And the test was carried out with the material absolutely cold.

Agathon Steels will serve your purpose best.

THE CENTRAL STEEL COMPANY
MASSILLON, OHIO

"AGATHON" Chrome Nickel
"AGATHON" ChromeVanadium
"AGATHON" Nickel Steels
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"AGATHON" Vanadium
"AGATHON" Chrome Steel
"AGATHON" High Carbon

Detroit Office: 326-27-28 Ford Bldg.
F. Walter Guibert, Dist. Represe tative.
Cleveland Office: Hickox Bldg.
The Hamill-Hickox Compa~y, District Represe tatives.
Chicago Office: 1370 Peoples Gas Bldg., 122 South Michigan Blvd.
A. Schaeffer, District Sales Manager.
Philadelphia Office: 902 Widener Building.
Fra k Wallace, District Sales Manager
J. E. Dockendorff & Co., 20 Broad Street, New York, General Export Agents.

AGATHON STEELS
TRADE MARK

Edgar Thomson plant of the Carnegie Steel Co. The Pittsburgh Steel Products Co. is building a $3,000,000 plant near Fayette City, Pa., for the manufacture of seamless tubes. Contracts for most of the equipment involved have been placed. The Youngstown Sheet & Tube Co., Youngstown, O., has bought one 20-ton and one 40-ton crane from the Cleveland Crane & Engineering Co., Wickliffe, O. The Jones & Laughlin Steel Co. recently distributed orders for about 15 cranes. The Pennsylvania railroad has revived its inquiry for a number of machine tools for a blacksmith shop at Altoona, Pa.

Good Business Continues in Cleveland

SOME Cleveland machine tool dealers report a marked slackening of business. The traffic situation is becoming more acute, deliveries on certain tools are very slow and plants building shell-making machines are far behind on contracts. Prices on shop equipment appear to be having an effect on the market. Several good inquiries, however, have appeared in the local market. The American Brake Shoe & Foundry Co., Erie, Pa., which was mentioned some time ago as preparing to enter the market for a wide line of equipment, notified the trade that it was about to purchase a number of tools. The Erie Forge Co., Erie, Pa., has also entered the market for some heavy machines. The General Motors Co., Detroit, recently noted as about to purchase a large assortment of heavy machines for one of the largest forge shops in the United States, is about ready to buy. It is thought by local dealers that this business will be closed during the week of July 23. The National Self Cooling Machine Co., Youngstown, S. Gillespie, general manager, has entered the market for shop equipment for a factory which has been recently purchased. This company plans to build ½-ton ice machines in addition to its line of electric coolers. The Canadian Cartridge Co., Hamilton, Ont., V. C. Lowry, purchasing agent, is in the market for a new or second-hand universal grinder. The John F. Byers Machine Co., Ravenna, O., R. D. Matteson, purchasing agent has entered the local market for several tools including one 48-inch radial drill, one No. 2 type plain miller and one, second-hand preferred, or new, 36-inch boring mill. The Kuhlman Engineering Co., 433 Superior street, Toledo, O., expects to be in the market in about 60 days for a 16-inch lathe. The Sidney Power Press Co., Sidney, O., recently incorporated with $75,000 capital stock, expects to purchase a number of machine tools for its new shop. The company plans to build power presses, punches and shears. The officers of the company are: W. E. Whipp, president; A. C. Getz, vice president; W. C. Horr, secretary, and E. H. Farrell, treasurer.

Deliveries on certain tools is becoming better, according to several local tool houses. Lathes, particularly, are approaching normal to a greater degree than has been the case for a number of months. Large-swing lathes, however, are hard to obtain, but in some cases good deliveries may be had on heavy tools of this type. Grinders, milling machines, both plain and universal screw machines, boring mills and planers are scarce. The labor situation is acute in some plants due to the shortage of skilled mechanics. The strike of the molders at the Niles Tool Works, Hamilton, O., has been settled and the workmen will return immediately.

The government has issued several inquiries for equipment for navy yards and projectile plants. The commanding officer of the Rock Island arsenal, Rock Island, Ill., will receive bids July 26 on one Warner & Swasey universal turret screw machine; one Bell adjustable rod and dowel machine and two No. 1 Cincinnati universal cutter grinders and on July 24 for one Alpha Brinnell machine and for one Defiance gunstock boring machine.

Bids are wanted until Aug. 7 by the bureau of yards and docks of the navy department for two motor-driven flat turret lathes; 10 engine lathes, four high-duty drills; one universal milling machine; one horizontal milling machine; boring and turning mill and motor-driven tool room lathe for extensions to the machine shop of the Mare Island, Cal., navy yard.

The commanding officer of the Frankford arsenal, Philadelphia, received bids until July 24 for furnishing three chucks for stocks, 50 dies for rear plugs and one holder complete with tools.

Manning, Maxwell & Moore have been awarded contract to furnish cranes for the proposed Charleston, W. Va., projectile plant and Pawling & Harnischfeger, Milwaukee, for electric traveling cranes for the New York navy yard.

New Construction and Equipment

Concise and Timely Business Building Opportunities from the Field of Industry

Among New England Factories

EAST BOOTHBAY, ME.—The shipbuilding plant of Rice Bros. was destroyed by fire recently, with a loss of $150,000. Several submarine chasers under construction also were destroyed.

BOSTON.—The United Lined Tube & Valve Co. has been incorporated with $100,000 capital by D. William Wade, M. Sumner Coggan, Malden, Mass., and others.

GLOUCESTER, MASS.—The Superior Mfg. Co. has been incorporated to make hardware with $60,000 capital by Benjamin A. Smith, Thomas P. Bolger and Frederick H. Tarr, Rockport, Mass.

MANSFIELD, MASS.—The Cookson Tire Fabric Mills, Inc., has let the contract for a brick, 1-story, 80 x 300-foot mill to cost $35,000.

NEWTON, MASS.—The American Crucible Co. has been incorporated with $150,000 capital by William E. McKee, 504 Center street, and others.

PITTSFIELD, MASS.—James and E. H. Wilson have awarded the general contract for a 1-story power house, 54 x 68 feet, to Fred T. Ley & Co., 499 Main street, Springfield.

SPRINGFIELD, MASS.—The Springfield Carburetor Co. has been organized with a capital stock of $500,000 by C. Schmelzar,

Three Questions--- and a Suggestion

Were you prepared for the crisis that came with the war?

Were you equipped for the first flood of orders from the Allies?

Are you ready for Peace and the changes it will bring?

Peace will make just as insistent demands on this country as the war did—and likewise these demands will be from overseas.

FEDEX your line so you will be prepared for whatever conditions the cessation of hostilities may cause.

We can co-operate with you now to your best advantage. At your service by letter, long distance or personal call.

FEDERAL EXPORT CORPORATION

115 Broadway, New York

Shipowners Exporters Bankers

George H. Morgenstern, Frank W. Arthur and Nathan P. Avery, Holyoke.

SPRINGFIELD, MASS. — The Goldstone Extension Mining Co. has been incorporated with $50,000 capital by N. L. Montague, Walter P. Hubbard and F. T. Brand.

WATERTOWN, MASS.—The Stone & Webster Engineering Corp., Boston, has been awarded the contract by the United States government for a foundry and equipment to cost $800,000 at the arsenal.

WORCESTER, MASS. — The Worcester Consolidated Street Railway Co. has purchased a site on Grove street for car barns, repair shops and administration buildings.

WORCESTER, MASS.—Mendel Block has let the contract for a brick, 2-story building to cost $40,000 at 28 Wellington street.

BOSTON.—The S. A. Woods Machine Co., Damrell street, South Boston, will build a 1-story machine shop addition, 90 x 100 feet.

WARREN, MASS. — The Warren Steam Pump Co. has started work on a 1-story, 65 x 105-foot plant addition.

NEWPORT, R. I.—Bids close July 30 for concrete and steel fuel storage tanks to cost $260,000 for the United States government at the coaling station, Melville, and for a concrete and brick, 1-story, 40 x 135-foot primer filling house to cost $30,000 on Rose Island.

NEW BRITAIN, CONN. — The Fafnier Bearing Co. will build a 1-story, 50 x 80-foot plant. E. H. Hibbard Co., 140 Main street, has the general contract.

WATERBURY, CONN. — Waterbury Mfg. Co. has started work on a 6-story, 60 x 172-foot plant addition to cost $100,000. H. S. Chase is president.

Along the Middle Atlantic Seaboard

ALBANY, N. Y.—McKinney & Son, 925 Broadway, have had plans drawn for a storage building and core room, 1-story, 28 x 62 feet, to cost $3000.

ALBANY, N. Y.—Burdick & Son, Inc., 72 Hamilton street, plan factory alterations to cost $40,000.

BROOKLYN, N. Y.—The Sperry Gyroscope Co. has let the general contract for an 11-story plant, 99 x 149 feet, to the Turner Construction Co., 244 Madison avenue, New York.

BUFFALO.—The New York Central railroad plans to erect a terminal, to cost about $4,000,000. K. Kittridge, Grand Central terminal, New York, is chief engineer.

BUFFALO.—The Smith Elevator Co. has been incorporated with $75,000 capital to engage in the manufacture of elevators and hoisting machinery. G. F. Burford, C. W. and M. E. Smith are the organizers.

CLYMER, N. Y.—The Clymer Power Corp. has been chartered with $25,000 capital to build and operate a power plant. G. W. and L. and G. H. Tenpass are the incorporators.

FARMINGDALE, L. I.—The Farmingdale Chemical Co. has purchased the plant of the E. C. Nelson Mfg. Co. here and will manufacture chemicals.

GROTON, N. Y.—The Groton Electrical Devices Co. has been incorporated with $105,000 capital to manufacture electric heating and drying machines. D. J. Watrous, B. and J. Conger are the incorporators.

HUNTINGTON, N. Y.—The Fire Gun Mfg. Co. has been incorporated with $500,000 capital to manufacture fire extinguishers by A. V. Sammis, W. N. and R. S. Baylis.

LEROY, N. Y.—The Penn York Gas & Oil Co. recently has been incorporated to deal in natural gas, coal, oil, etc., with $1,000,000 capital. J. A. Beck, W. H. Lobaugh and S. L. Purdy are the incorporators.

NIAGARA FALLS, N. Y.—The National Electrolytic Co. will build a heating plant.

NEW YORK.—The United Steel & Metal Corp. has been chartered with $100,000 capital to deal in iron, steel and metals. F. Viethardt, A. Heller and M. Sternberg, 906 Broadway, are the incorporators.

NEW YORK.—The American Safety Nut Lock Co., capital $100,000, has been chartered by Arthur C. Platt, W. J. Arkell and A. A. Kelly, Montclair, N. J.

NEW YORK.—The Hudwill Corp. has been incorporated with $50,000 capital to manufacture machinery and apparatus for general contractors. H. P. and W. K. and M. W. Rose, 7 West Forty-fifth street, are the incorporators.

NEW YORK.—The Evertite Locknut Corp. recently has been incorporated with $150,000 capital for the manufacture of lock nuts and other mechanical devices. A. F. McCabe, G. F. Jebbet and A. E. Moore, 37 Wall street, are the incorporators.

NEW YORK.—The Tidewater Steel Products Co. recently has been chartered with $5000 capital to do a general brokerage business. A. P. Anderson, G. C. Heater and K. R. Norton, 34 Nassau street, are the incorporators.

NEW YORK.—The U. S. P. Salicylic Co. has been incorporated with $50,000 capital to engage in the manufacture of chemicals. V. E. Gartz, A. Golden and E. W. Kluchansky, Times building, are the incorporators.

NEW YORK.—F. W. Jesup & Co., capitalized at $10,000, will engage in the manufacture of agricultural implements . F. Gomes, F. W. and A. S. Jesup, 416 Macon street, are the incorporators.

OSWEGO, N. Y.—The board of education plans to erect a 3-story school building. W. Potter, 1 Union Square, New York, is preparing the plans.

SYRACUSE, N. Y.—The board of education plans to erect a 3-story school building at 512 Emerson avenue, to cost about $150,000. Gordon & Wright, Union building, are preparing the plans.

SYRACUSE, N. Y.—The board of education has awarded the Phelan Building & Construction Co., 79 River street, Hoboken, N. J., the contract to erect a school building, to cost about $500,000.

SYRACUSE, N. Y.—The Miller-Jones Corp., capitalized at $20,000, has been organized to conduct a general machine shop business by F. E. and C. B. Miller and A. L. Jones.

TROY, N. Y. — The board of education plans to erect a high school building on Columbia Terrace. Tooker & Marsh, 101 Park avenue, New York, are preparing the plans.

BENTLEYVILLE, PA. — The By-Product Smokeless Coal Co., capitalized at $10,000, was incorporated a short time ago by George F. Baker and others.

BRISTOL, PA.—Rahn & Haas, chemical manufacturers, Philadelphia, have purchased 45 acres adjoining their present plant and will utilize the additional property for dwellings for its employes.

BROWNSVILLE, PA.—The board of education will erect a 2-story school building, 65 x 110 feet, to cost about $60,000. The Brownsville Construction Co. has been awarded the contract.

CHESTER, PA.—The Crown Smelting Co. is erecting an addition to its foundry on Concord avenue.

CONSHOHOCKEN, PA.—The Hale Fire Pump Co., chartered with $20,000 capital, has been organized to manufacture machinery by Evert J. Wendell, Wayne, Pa., and others.

DUNBAR, PA. — The Pennsylvania Wire Glass Co. has awarded the general contract for a boiler house costing $6000 to F. W. Van Loon, 4 North Eleventh street, Philadelphia.

FAYETTE CITY, PA. — The Pittsburgh Steel Products Co. has announced a building project involving the expenditure of $3,000,000, including the building of a new plant and a new town. W. S. Taylor is assistant engineer of the company.

LAUREL RUN BORO, PA.—The Mann Metals & Iron Co. has been organized with $20,000 capital by Frederick Strong and others.

PHILADELPHIA.—The Auto Radiator Co., 1315 Vine street, has been granted a permit to erect a new manufacturing building.

PHILADELPHIA. — A permit has been granted to the Brown Construction Co. to erect for Hey & Co. a concrete and steel coal trestle at Hermit avenue and Twenty-first street.

PHILADELPHIA. — A permit has been granted for the erection of an addition to the machine shop of A. Kestekian, 5437 Baltimore avenue.

PHILADELPHIA.—Guy King & Co., architects, are drawing plans for a 4-story, brick and concrete, 37 x 78-foot manufacturing building with a 16 x 30-foot wing, to be erected at 114 North Front street, for George P. Wetherill & Co.

PHILADELPHIA.—H. C. Gray will build a 1-story, 41 x 96-foot brick machine shop to cost $16,000.

PHILADELPHIA.—The Charles L. Ennig Co. has let a contract for the erection of an addition to its plant at Richmond and Kennedy streets.

PHILADELPHIA.—F. T. Mercer has obtained a permit to erect a machine shop addition at Tacony and Lewis streets for the John Illingworth Steel Co.

PHILADELPHIA.—The Hohlfeld Mfg. Co. which occupies a 3-story plant at 926 Sedgley avenue, has purchased adjoining land.

PITTSBURGH.—The Non-Derrick Drilling Machine Co. recently has been incorporated with $200,000 capital to carry on a manufacturing business, by Wilber A. McCoy and others.

Activities in the Central States

HARTFORD, CONN.—The Hartford Electric Light Co. has increased its capital from $4,500,000 to $6,000,000 and will install a 10-000-kilowatt turbine at its power plant at Dutch Point.

MADISON, WIS.—Arthur Peabody, Madison, architect, is preparing plans for three new buildings for the University of Wisconsin, to cost about $150,000. The structures are: central heating plant addition; addition to college of engineering, and infirmary. M. E. McCaffrey is secretary of the board of regents.

MILWAUKEE.—A. W. Snyder, formerly of Burlington, Wis., has organized a company to erect a foundry and manufacturing building for the production of automobile parts. Plans have been drawn for a 2-story, 120 x 240-foot structure to cost about $75,000.

MILWAUKEE.—The Fraser Co., 667 East Water street, mill and elevator engineer and builder, will take bids about Sept. 1 for the erection of a 7-story, reinforced concrete brick elevator and warehouse, 150 x 180 feet in size, for the L. Toweles Seed Co., 113 Clybourn street, Milwaukee. The estimated cost is $200,000.

WEST ALLIS, WIS.—Contracts will be awarded soon by the newly organized Independent Foundry Co., for the erection of its new gray iron shop, to be 75 x 110 feet in size and cost $20,000. It will be located at Fifty-fourth avenue and Burnham street. August M. Fons is secretary.

NEW LONDON, WIS.—A 1-story addition, 40 x 65 feet, will be erected by George Freiburger & Sons, machinists, blacksmiths and wagon-makers.

SUPERIOR, WIS.—A permit for a $35,000 power house as part of the Great Northern Railway's new machine and repair shops on Belknap avenue, Superior, has been issued to the Westinghouse-Church-Kerr Co., general contractor on the job.

TORRINGTON, CONN.—The Turner & Seymour Mfg. Co. has let the contract for a reinforced concrete, 50 x 150-foot addition for foundry purposes.

CHAMPION, MICH.—The board of education has engaged architect John D. Chubb, 109 North Dearborn street, Chicago, to prepare plans for a 3-story school building to cost $75,000.

CONSTANTINE, MICH. — The Peerless Foundry Co. recently has been incorporated with $10,000 capital to engage in a general foundry business. Harry W. Pidgeon, John C. Menne and Ross Armstrong are the incorporators.

DETROIT.—The Gorham & Goddard Co., capitalized at $75,000, has been incorporated to manufacture and salvage machines and tools. A. N. Goddard, Dwight Goddard, L. C. Gorham and others are the incorporators.

MUSKEGON, MICH.—The Linderman Machine Co., B. E. Leioff manager, soon will award contracts for a 100 x 500-foot factory addition.

BELLEVILLE, ILL.—The Twentieth Century Brass Works, capital $25,000, has been chartered by William Althoff, Henry A. Lengfelder and Walter J. Ruediger.

BENTON, ILL.—Architects N. S. Spencer & Son, 37 West Van Buren street, Chicago, have prepared plans for a 2-story school building for Benton, Ill., to cost $30,000.

CARRIER MILLS, ILL.—The Mine Trap Signal Co. has been incorporated with $10,000 capital to manufacture signaling and safety devices by J. A. Schellender, S. W. Latham, and Harry Mandrell.

CHICAGO.—The Helm-Built Oven Co. has been organized by C. W. Helm, L. T. Hill and O. C. Meissler with $75,000 capital.

CHICAGO.—The Chicago Screw Co. has obtained a 66 x 1255-foot site on which it plans to erect a $500,000 plant.

CHICAGO.—The National Electric Lamp association has purchased property on Flournoy street, which it plans to improve with a factory building.

CHICAGO. — The Chicago Charcoal Co. plans to erect a 1-story, 59 x 84-foot storage building.

CHICAGO.—John Griffiths & Co. have been awarded the contract for constructing additional barracks at the Great Lakes training station to cost $1,000,000. The buildings are to be ready for occupancy in two months. with industrial buildings.

CHICAGO.—The Sinclair Refining Co., 111 West Washington street, plans to erect a 3-story barrel house and a 1-story boiler house, 84 x 149 feet, and 42 x 59 feet, respectively. The estimated cost of the buildings is $50,000.

CHICAGO.—The Monarch Leather Co. has engaged architects Ottenheimer, Stern & Reichert, 220 South State street, to prepare plans for a $150,000, 5-story, 60 x 150-foot factory with an annex. It will be of mill construction and will be equipped with automatic sprinklers.

CHICAGO.—The Staver Motor Car Co. has had plans prepared by Engineer W. C. Bennett, 327 South La Salle street, for a 3-story, 110 x 175-foot reinforced concrete factory building.

CHICAGO.—Harry L. Holton has received bids through architect L. E. Russell, 25 North Dearborn street, on a 1-story, 75 x 100-foot factory to cost about $15,000.

The Pacific Coast States

CANYON CITY, WASH.—Bids will be received by H. W. Powell, county clerk, until Aug. 1 for the construction of a bridge over John Day river. The plans call for a 180-foot Howe truss span.

CENTRALIA, WASH.—R. Thomas, president and manager of the Thomas Pulp & Paper Co., Portland, Oreg., is reported to have closed a deal for the purchase of 300 acres of coal land in the Hannaford valley. The Thomas company will erect a power plant here and a paper mill in Aberdeen.

OLYMPIA, WASH. — A contract for the construction of the Coweman river bridge was awarded to the Monson Construction Co., Portland, by the state highway commission, the the contract price of $18,427.

OLYMPIA, WASH. — The Puget Sound Steel Corp. recently has been incorporated with $5,000,000 capital to build steel ships and machinery of all kinds. A. P. Gilles, John L. Newell, A. C. Lindsay and others, are the incorporators.

OLYMPIA, WASH.—A contract has been awarded to Larson & Co., Tacoma, for the construction of a $25,000 plant for the Capitol City Iron Works.

SEATTLE.—The Monson Construction Co. has been awarded the contract for a $34,829 bridge at Duvall.

SEATTLE.—The Hoods Mfg. Co. has applied for a permit to erect a 70 x 100-foot iron foundry.

SEATTLE.—The Smelter Steel Co. has been organized with $1,500,000 capital by C. L. Casey, T. M. Pidduck and F. W. Ferch.

SEATTLE.—The B. Stolt-Nielsen Steamship Co. has been organized with $3,000,000 capital by Egil Johnson.

SEATTLE.—The Star Machinery Co. and the Aurora Foundry Co. each have selected sites for new plants in the industrial district.

SEATTLE.—The Skinner & Eddy Transportation Co. has been incorporated with a capital stock of $750,000 by D. E. Skinner, John W. Eddy and L. B. Stedman.

SEATTLE. — The Olympic Steel Works, 5200 Ninth avenue, has completed plans for erecting a small foundry building on Horton street at a cost of $6000.

SEATTLE.—Meacham & Babcock, Central building, architects, have completed plans for the construction of a small warehouse, for the shipbuilding plant at 1615 Thurman street.

SEATTLE.—The Phoenix Gas Engine Mfg. Co. has been chartered with $800,000 capital by C. R. Williams and others.

SEATTLE.—Edward A. Nelson has been awarded a contract by the Eagle Brass Foundry Co. to construct a 2-story, 90 x 105-foot factory building on Spokane avenue to cost $10,000.

SEATTLE. — The Seattle Machine Works has completed plans for the construction of a $20,000 plant.

TACOMA, WASH.—Bids will be received up to July 31 for 350 tons of 60 to 70-pound relaying rails for the proposed extension of the city car line on the tide flats.

PORTLAND, OREG. — The Hesse-Martin Iron Works is having plans prepared for additions to its plant inclusive of a foundry and forge shop. The estimated cost is $100,000.

LOS ANGELES.—L. Phillips has let the general contract for a 3-story, 92 x 128-foot, reinforced concrete store building to the Kubach Co., Merchants National Bank building. The estimated cost of the structure is $107,500.

NICOLAUS, CAL.—The county has let the contract for the superstructure of a bridge over Feather river to the Clinton Construction Co. at the contract figure of $54,250.

Iron and Steel Prices

Corrected to Tuesday noon

IRON ORE

Superior Ores, Per Ton, Lower Lake Ports.

Old range Bessemer, 55 iron	5.95
Mesabi Bessemer, 55 iron	5.70
Old range non-Bess., 51½ iron	5.20
Mesabi non-Bess., 51½ iron	5.05

Port Henry Ores, non-Bessemer, Per Unit, Delivered Eastern Pennsylvania.

Old Bed, crude 55 iron	10.50c to 11.00c
Old Bed., concent., 65 iron	11.00c to 11.50c
Harmony, concent., 63 iron	11.50c to 11.75c
Lump (at mines)	$5.75

WAREHOUSE PRICES

Steel bars, Chicago	4.50c
Steel bars, Cleveland	5.00c
Steel bars, Detroit	4.50c
Steel bars, Philadelphia	5.00c to 5.50c
Steel bars, New York	5.00c
Steel bars, St. Louis	4.55c
Steel bars, Cincinnati	5.00c
Steel bars, St. Paul	4.60c
Steel bars, Buffalo	4.60c to 5.10c
Iron bars, Chicago	4.50c
Iron bars, Cleveland	4.95c
Iron bars, Detroit	4.50c
Iron bars, St Louis	4.45c
Iron bars, Cincinnati	5.00c
Iron bars, Philadelphia	5.00c
Iron bars, New York	5.00c
Shapes, Chicago	5.00c
Shapes, Detroit	5.00c
Shapes, St. Louis	5.05c
Shapes, St. Paul	5.10c
Shapes, New York	5.25c
Shapes, Cleveland	5.25c
Shapes, Philadelphia	5.00c to 5.50c
Shapes, Buffalo	5.10c to 5.35c
Shapes, Cincinnati	5.25c
Plates, Chicago	8.00c
Plates, Detroit	9.00c to 10.00c
Plates, St. Louis	7.05c to 7.55c
Plates, St. Paul	7.10c
Plates, New York	9.00c
Plates, Cleveland	7.50c
Plates, Philadelphia	9.50c to 10.00c
Plates, Cincinnati	9.50c
No. 10 blue anl. sheets, Chi.	9.50c
No. 10 blue anl. sheets, Cleve.	9.50c
No. 10 blue anl., Buffalo	11.00c to 11.75c
No. 10 blue anl. sheets, St. L.	9.55c
No. 10 blue anl. sheets, Cinci.	9.50c
No. 10 blue anl. sheets, St. Paul	9.60c
No. 10 blue annealed, Detroit	9.50c
No. 28 black sheets, Chicago	9.50c
No. 28 black sheets, Cleve.	9.50c
No. 28 black sheets, Cincin.	8.65c
No. 28 black, Detroit	9.50c
No. 28 black sheets, St. L.	9.85c
No. 28 black sheets, St. Paul	9.60c
No. 28 galv. sheets, Chicago.	11.00c
No. 28 galv. sheets, Cleve.	11.00c
No. 28 galv. sheets, Cincin.	10.65c
No. 28 galvanized, Detroit	11.00c
No. 28 galv. sheets, St. L.	11.25c to 12.00c
Hoops, Cleveland	6.00c
Hoops, Detroit	7.00c

IRON AND STEEL SCRAP

STEEL WORKS USE

(Gross Tons)

Bundled sheets, Pittsburgh	$25.00 to 27.00
Bundled sheets, Cleveland	27.00 to 28.00
Bundled sheets, Buffalo	21.00 to 21.50
City wrought, short, N. Y.	30.00 to 31.00
Frogs, switches, guards, St. L.	36.00 to 36.50
Heavy melting steel, Pitts.	36.00 to 38.00
Heavy melting steel, Buffalo	34.00 to 35.00
Heavy melting steel, Chgo.	33.00 to 34.00
Heavy melt'g steel, Cleveland.	32.00 to 33.00
Heavy melting steel, Cincin.	34.00 to 34.50
Heavy melting steel, east. Pa.	34.00 to 36.00
Heavy melting steel, N. Y.	30.00 to 31.00
Heavy melting steel, St. L.	37.00 to 38.00
Heavy melt'g steel, Birming.	21.00 to 22.00
Hydraulic pressed sh'ts, Cleve.	31.00 to 32.00
Hydraulic press. sheets, Pitts.	31.00 to 32.00
Hydraulic pressed sh'ts, Chgo.	25.00 to 25.50
Low phos. steel, Buffalo	48.00 to 50.00
Low phos. steel, Pittsburgh.	46.00 to 50.00
Low phos. steel, eastern Pa.	56.00 to 58.00
Shoveling steel, Chicago	30.00 to 31.00
Shoveling steel, St. Louis	34.00 to 35.00
Steel rails, short, Chicago	43.00 to 43.50
Steel rails, short, Cleveland.	41.00 to 41.50
Steel rails, short, St. Louis.	39.00 to 40.00
Steel rails, old, Birmingham.	27.00 to 28.00
Stove plate, Cincinnati	18.00 to 18.50
Stove plate, St. Louis	18.00 to 18.50
Stove plate, N. J. points	21.00 to 21.50
Stove plate, Birmingham	17.50 to 18.00
Stove plate, Buffalo	20.00 to 21.00
Stove plate, eastern Pa	22.00 to 23.00
Stove plate, Pittsburgh	25.00

(Net Tons)

Boiler plate, cut, No. 1, Chgo.	$22.00 to 23.00
Boiler plate, cut, No. 1, St. L.	20.00 to 20.50
Bundled sheet, Cincinnati	19.75 to 20.25
Knuckles, coup., Chicago	41.00 to 42.00
Knuckles, coup., St. Louis	32.00 to 33.00
Springs, Chicago	42.00 to 43.00
Stove plate, Chicago	19.00 to 20.00
Stove plate, Cleveland	21.00 to 22.00

Freight Rates, Pig Iron

Mahoning and Shenango valleys to:	
Cleveland	$0.95
Newark, N. J.	2.98
Boston	3.18
Philadelphia	2.78
Pittsburgh	.95
St. Louis	3.18
Minneapolis, St. Paul	4.54
Buffalo to:	
Albany, N. Y.	$1.26
New England (rail)	2.58
New York and Brooklyn (rail)	2.58
Virginia furnaces to:	
Boston docks (r. and w.)	$3.05
New England (all rail)	3.25
New York dock (r. and w.)	2.88
Birmingham, Ala., to:	
Cincinnati	$2.90
Chicago	4.00
Cleveland	4.00
Louisville, Ky.	2.65
Minneapolis, St. Paul	5.85
New York (r. and w.)	4.25
Philadelphia (r. and w.)	4.00
Pittsburgh	4.90
Savannah, Ga.	2.75
St. Louis	3.40
Chicago to:	
Des Moines	$2.80
Milwaukee	.50
Minneapolis, St. Paul	2.00
Moline, Ill.	1.40
Omaha	3.58
St. Louis	1.58
Ironton and Jackson, O., to:	
Chicago	$2.54
Cincinnati	1.26
Cleveland	1.62
Detroit	1.81
Indianapolis	1.58
Minneapolis, St. Paul	4.54
Duluth, Minn., to:	
Minneapolis-St. Paul	$1.25
Mayville, Wis.:	
Minneapolis-St. Paul	$1.75

Freight Rates, Finished Material

Pittsburgh, carloads, per 100 lbs., to:	
New York	16.9 cents
Philadelphia	15.9 cents
Boston	18.9 cents
Buffalo	11.6 cents
Baltimore	15.4 cents
Cleveland	10.5 cents
Cincinnati	15.8 cents
Chicago	18.9 cents
Detroit	15.7 cents
Minneapolis and St. Paul	32.9 cents
Denver	76.1 cents
St. Louis	23.6 cents
New Orleans	30 cents
Birmingham	45 cents
Pacific coast (all rail)	73.9 cents
Pacific coast (tin plate)	70 cents
Pacific coast, via Panama	61.0 cents

IRON MILL USE

(Gross Tons)

Busheling No. 1, Buffalo	31.00 to 32.00
Busheling, No. 2, Buffalo	21.00 to 22.00
Busheling, No. 1, Pittsburgh.	25.00 to 27.00
Cast borings, New York	19.00 to 20.00
Cast borings, eastern Pa.	22.00 to 22.50
Cast borings, Buffalo	20.00 to 21.00
Cast borings, Pittsburgh	22.00 to 24.00
City wrought, long, New York	37.00 to 38.00
Forge flashings, small, Cleve.	29.50 to 30.00
Forge flashings, large, Cleve.	27.00 to 28.00
Forge, No. 1, eastern Pa.	23.50 to 25.00
Grate bars, Buffalo	22.00 to 23.00
Grate bars, N. J. points	19.00 to 19.50
Iron axles, Pittsburgh	50.00 to 52.00
Iron axles, Cincinnati	45.50 to 46.00
Iron axles, eastern Pa.	50.00 to 55.00
Iron axles, Buffalo	50.00 to 55.00
Iron rails, Chicago	41.00 to 42.00
Iron rails, Buffalo	43.00 to 44.00
Iron rails, Cincinnati	34.50 to 35.00
Iron rails, St. Louis	41.00 to 41.50
Iron rails, Cleveland	43.00 to 44.00
Machine turnings, Buffalo	20.00 to 21.00
Machine turnings, Buffalo	$18.00 to 19.00
Machine shop turnings, N. Y.	18.00 to 18.50
Mach. shop turnings, Pitts.	21.00 to 23.00
Mch. shop turnings, east. Pa.	21.50 to 22.00
Machine turnings, Birming.	13.00 to 14.00
R. R. mch. cast, No. 1, Buff.	30.00 to 31.00
R. R. wrought, 1, Buffalo	46.00 to 48.00
R. R. wrgt., No. 1, east. Pa.	47.00 to 50.00
R. R. wrought, No. 1, Pitts.	43.00 to 44.00
R. R. wrought, 1, B'ham.	30.00 to 31.00
Wrought pipe, Buffalo	33.00 to 34.00
Wrought pipe, eastern Pa.	34.00 to 36.00
Wrought pipe, New York	31.00 to 32.00

(Net Tons)

Angle bars, iron, Chicago	$41.00 to 42.00
Angle bars, steel, St. Louis.	33.50 to 34.50
Arch bars & transoms, St. L.	41.00 to 42.00
Arch bars & Transoms, Chgo.	43.00 to 44.00
Busheling, No. 1, Chicago.	29.00 to 30.00
Busheling, No. 1, Cincinnati	21.50 to 22.00
Busheling, No. 1, Cleveland.	25.00 to 25.50
Busheling, No. 1, St. Louis.	27.50 to 28.50
Busheling, No. 2, Chicago.	20.50 to 21.00
Cast borings, Cincinnati	13.50 to 14.00
Cast borings, Cleveland	18.00 to 18.50
Cast borings, St. Louis	17.50 to 18.00
Cast borings, Chicago	17.00 to 18.00
Cut forge, Chicago	36.50 to 37.50
Grate bars, Cleveland	21.50 to 22.50
Iron axles, St. Louis	51.00 to 52.00
Iron axles, Chicago	47.00 to 48.00
Iron axles, Cleveland	47.00 to 47.50
Machine shop turnings, Chgo.	18.00 to 19.00
Mach. shop turnings, Cleve.	16.50 to 17.00
Machine shop turn'gs, Cinci.	13.50 to 14.00
Mach. shop turnings, St. L.	19.00 to 19.50
Pipes and flues, Cleveland	24.00 to 24.50
Pipes and flues, Chicago	25.00 to 26.00
Pipes and flues, St. Louis	22.50 to 23.00
Railroad wrought, 1, Cleve.	44.00 to 44.50
Railroad wrgt., No. 1, Chgo.	36.50 to 37.00
Railroad wrought, 1, Cinci.	34.50 to 35.00
Railroad wrought, 1, St. L.	36.00 to 37.00
Railroad wrgt., No. 2, Chgo.	35.00 to 36.00
Railroad wrought, 2, St. L.	34.00 to 35.00

IRON OR STEEL WORKS USE

(Gross Tons)

Axle turnings, Cleveland	$26.50 to 27.00
Axle turnings, Buffalo	26.00 to 27.00
Shafting, New York	45.00
Shafting, eastern Pa.	48.00 to 50.00
Steel car axles, Birmingham.	33.00 to 35.00
Steel car axles, New York.	54.00
Steel car axles, Buffalo	55.00 to 60.00
Steel car axles, Cleveland	51.00 to 52.00
Steel car axles, Pittsburgh.	50.00 to 55.00
Steel car axles, eastern Pa.	50.00 to 55.00

(Net Tons)

Shafting, St. Louis	40.00 to 42.00
Steel car axles, St. Louis	50.00 to 52.00
Steel car axles, Chicago	44.00 to 45.00

IRON FOUNDRY USE

(Gross Tons)

Car wheels, (iron), Pitts.	$35.00 to 38.00
Car wheels, (steel), Pitts.	45.00
Car wheels, Chicago	35.00 to 36.00
Car wheels, eastern Pa.	40.00
Car wheels, Buffalo	35.00 to 37.00
Car wheels, New York	35.00
Car wheels, St. Louis	34.50 to 35.00
Car wheels, Birmingham.	26.00 to 27.00
Car wheels, Cleveland	32.00 to 32.50
Tram car wheels, Birming.	23.00 to 24.00
Cast, No. 1, Birmingham	22.00 to 23.00
Cast, 1, machy., N. J. points	38.00
Cast, 1, heavy, N. J. points.	38.00
Cast, No. 1, eastern Pa.	34.00 to 36.00
Cast, No. 1, Pittsburgh	35.00 to 36.00
Malleable railroad, Cincinnati	21.50 to 22.00
Malleable railroad, Cleveland.	31.00 to 32.00
Malleable railroad, Buffalo	32.00 to 33.00
Malleable railroad, Pittsburgh	29.00 to 31.00
Malleable railroad, east. Pa.	32.00 to 34.00

(Net Tons)

Cast No. 1, Cleveland	30.00 to 31.00
Cast, No. 1, Chicago	28.00 to 29.00
Cast, No. 1, Cincinnati	25.00 to 25.50
Cast, No. 1, St. Louis	25.00 to 26.00
Malleable railroad, Chicago	30.50 to 31.50
Malleable railroad, St. Louis	29.50 to 30.00
Malleable agricultural, Chgo.	25.50 to 26.50

MISCELLANEOUS USES

(Gross Tons)

Reroll. rails, 5 ft. & ov., Pitts.	$50.00
Reroll. rails, 5 ft. & ov., Chgo.	43.50 to 44.00
Reroll. rails, 5 ft. & ov., E. Pa.	50.00 to 55.00
Reroll. rails, 5 ft. & ov., St. L.	43.00 to 44.00
Reroll. rails, 5 ft. or ov., Cleve.	45.00 to 46.00
Rerolling rails, long, Birming.	37.50 to 38.50

(Net Tons)

Boiler punchings, Chicago	34.00 to 35.00
Locomotive tires, Chicago	50.00 to 51.00
Locomotive tires, St. Louis.	47.00 to 48.00